TELEPHONY

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Helpful Hints for Selling Service

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PROSPECT CARDS for every family which does not have a telephone in your town and in the rural territory covered by your company should be made out, and properly filed alphabetically. These cards should be kept in alphabetical order and be under the control of one person, who will have the right to hand them out to salesmen or other employes for the purpose of making calls.

A record should be kept of every prospect card handed out. It would be best to keep duplicate cards in the central file, noting thereon the name of the person to whom the card has been given.

Study your prospect cards carefully. If the prospect lives in town, get all possible information regarding him or her, or the family.

What relatives or friends do they have who have telephones?

To what lodges or clubs do they belong?

How many children are there in the family and what are their ages? From this information you can determine how much benefit the children will derive from a telephone in the home.

If the prospect is a man, what is his occupation and approximately how much does he make?

Does he own an automobile?

Did he ever have a telephone?

Whose telephone does the family use now usually?

These are typical questions which should be answered before you make the call, because in

making sales, there is nothing so helpful as advance planning. There is hardly a prospect who cannot be sold a telephone if you will only give the time and thought to studying his problems and direct attention in specific ways to his need for it. Get all the facts you can regarding the local telephone situation.

How many local telephone calls are handled per day? How many long distance calls?

How many business telephones are there?

How many residence telephones?

How many telephones are there in the country?

What roads do the rural lines cover, and how far do they extend from the main city?

Get all of these facts and more, if possible, so that you will have something interesting to talk about when you call on the prospect. There is nothing that commands the respect and attention of the listener like the courteous presentation of facts. Keep posted on the people who are putting in telephones so that you can tell your prospects the names of new subscribers.

Mention these subscribers by name and tell what they said after the telephone was installed, or repeat other comments which will make interesting conversation. People are always interested in hearing what is said, not only by their friends or neighbors, but by other people from the same community, even though they may not be acquainted personally. You must do a lot of thinking so that you will have an abundance of interesting information to present as the occasion arises.

On the other hand, do not talk too long. When it is possible to make a sale quickly and get out, that is always the thing to do. There are many times, however, when considerable conversation is necessary to

IS IT EASY TO SELL? Can I become a high scorer as a "bring 'em back" telephone salesman? Successful advertising salesman with years of experience in telephone field urges you to equip yourself with interesting facts as well as ready answers to every anticipated objection. You will find many helpful suggestions in this article.

bridge the gap after the prospect has said "No." Under present-day methods of selling, this conversation should be definite and consist mostly of facts. The best salesmen are those who have studied the problems of the prospect they are going to talk to, so that when they call upon him, they know as much about his problems as he does himself, so far as the use of a telephone is concerned.

Prepare Answers To Every Objection

Marshal all possible arguments and answers to objections. Write in a notebook the objections which you hear from day to day, and then write on the opposite page your best answers to that particular objection.

You can tell any prospect that everyone is using telephone service now, and those people who do not have telephones in their homes are greatly inconvenienced by finding it necessary to go some place else to use a telephone whenever the need arises.

There are many strong arguments which can be advanced, using protection as the central theme, including all kinds of emergencies, fire, sickness, etc. Then the value of the telephone for social contacts is one of your strongest arguments. Children need telephones in order to keep in touch with their schoolmates, and young men and young women need telephones in order to make social engagements.

The time-saving element is important, too. If a man or woman does work or takes orders of any kind, he needs a telephone so that his customers can get in touch with him.

There are so many arguments you can give the farmers for installing telephones, which do not apply to people living in towns. I shall not attempt to list all of the arguments for installing telephones, because every salesman should do that for himself.

A study will convince anyone that a telephone offers the greatest value for the least money of any utility. Other utilities, such as gas, water and electricity, require the subscriber to install the facilities for using the utility on the inside of the house, but when a telephone is installed, the telephone company furnishes everything.

The cost of a telephone in a residence usually averages from five to ten cents per day and, with the unlimited service which is possible in the small towns, gives a value with which nothing else can compete. The price of a cigar, a half-gallon of gasoline, an ice cream soda, or any number of other things for which people spend money every day, exceeds the price of telephone service for a day.

One of the most common objections will be: "We cannot afford to have telephone service." You should marshal all your facts and all possible information concerning the prospect before making the call, so that you have a good come-back to this argument. You will find, after studying each card carefully, that the majority of people give this answer because it is a stock phrase which will scare away and get rid of many salesmen in other lines.

Probably less than 5 per cent of the people whom you will interview really cannot afford a telephone. Many of these cases will be eliminated before the calls are made, because you will find out about the entire financial circumstances of the prospect. Anyone who has any social contacts or who has friends or relatives in the community, or children or business interests of any kind, cannot afford to be without a telephone.

Have the information operator talk to all of the employes and tell them of the calls she gets every day on the information desk asking for different people who do not have telephones.

Every good salesman starts out in the morning in a cheerful frame of mind, for his attitude is contagious. If he or she has carefully studied the prospect cards the night before, he is anxious to get started and will make more calls that day than if the cards had not been studied.

No Substitute For Preparedness

There is no substitute for preparedness. The salesman who is prepared has confidence when he meets the prospect, for he has sold himself on the idea that the prospect should order a telephone. Many good salesmen feel that sales are made before the salesman actually starts talking to the prospect. In other words, the sales are first made in the salesman's own mind when he is sold on the fact that the prospect should have, yes, must have, a telephone.

There is no turning back or dodging from a good salesman who has all the answers to every question. Many prospects will tell the salesman the first things that comes to their minds as a means of getting rid of him, and most objections can be disposed of very quickly when a salesman is properly in control of the interview. Many salesmen put up a good appearance and a good presentation, but do not have the power of going that last 10 per cent of the way necessary to make a sale, that last 10 per cent which means getting the name on the dotted line.

How will you get the prospect to sign? Ask for his order! There are many ways to ask for orders, and every salesman will find by experience the method or methods which are best adapted for his use. Sometimes you can ask for the order at the time when the prospect looks ready, by asking him whether he would rather have the telephone in the living room or in the kitchen. Or you can say: "Just sign here and I will have the telephone installed tomorrow."

Diverse Ways Of Soliciting Orders

Another time you might ask for the order by saying, "Do you like the desk telephone or handset best?" When the prospect answers, check it on the contract, fill out the contract and hand it to the prospect for signature. Or you might say, "Don't you think your wife would prefer the handset?"

There are many other ways, and each salesman should figure out every possible manner in which he can ask for the order, which he can use. It is an infallible rule that every salesman should ask for the order at least four times before leaving the prospect's presence.

Most sales should be made on the first interview. You should not feel that there is anything particularly difficult about closing a sale for a telephone. On the contrary, you would consider it as a natural result of a well-planned sales canvass.

The close is the most critical phase of the sale, and it requires skill. However, there is no reason for the salesman to magnify its difficulties. Young, inexperienced salesmen especially suffer on this account and get stage fright when they are ready to make the close, and the dread thus produced will defeat the sale just as surely as anything that the prospect could do or say.

Suggestion is the greatest power at the command of the salesman. By the use of suggestion, the salesman is able to establish in the mind of the prospect a state of receptivity which will sometimes make the sale almost automatic. In other words, the prospect thinks he has sold himself on the idea; and that is the ideal type of sale.

When talking to a prospect the salesman should get his undivided attention. The majority of salesmen talk too much. It is an art to know when the sale is made in the mind of the prospect, and then quit talking.

Take out your telephone order form, place it in front of the prospect

at a convenient time so that he will become accustomed to seeing it. Then at the right moment, go ahead and fill it out. It is very important to make affirmative closing suggestions. The salesman should not ask questions which can be answered by "No."

Do not debate. Do not argue. Do not talk too much or too fast. Do not dodge an objection or question. Answer it fairly and squarely. Do not antagonize the prospect. Talk to him in a friendly and agreeable manner.

Nail the order down after the sale has been made. In other words, explain just what the order covers, the date the telephone bill will come in each month, the number of days allowed for final payment, etc. Then after the telephone has been installed, telephone the subscriber and make certain that everything is satisfactory and that it was installed at the time promised.

This is what is called "nailing down the order" so the customer will be satisfied and in all probabilities remain a subscriber. If there is a provision in the contract which means that the telephone must be retained a certain number of months, this should be carefully explained to the new subscriber when the order is taken.

In filling out the order, always make certain that the name is spelled correctly, that the address is correct and that everything on the contract is readable so that it will be properly handled and interpreted by others after it has left your hands. It costs no more to be accurate than it does to be careless, but it makes all the difference in the world in building up the record of a salesman.

Orders Usually Proportionate to Calls

The salesmen who get the most orders are usually the ones who make the most calls. The salesman's work should be organized so that he will not high spot and jump to all parts of town. Instead, he will make calls that are within reasonable distance of each other, in order to avoid wasting time in getting from one prospect to another.

In selling telephone service it is often necessary to make evening calls when the husband and wife are together. Good salesmen are never afraid of working overtime. It is also important to learn the correct pronunciation of the names of people you intend to interview. Always keep appointments—it pays. Leave a card when you have completed your interview so that the prospect may have your name and address, but never depend upon a card to get interviews.

Remember this: How far you get in the business of selling telephone service depends upon you alone. The proper attitude on the part of the salesman, backed up by facts and planning, will make the prospect change from the position of thinking the reasons "why I cannot buy" to thinking of the reasons "why I should buy."

Some salesmen mistake attention for interest. A man is interested in his own problems more than anything else in the world, and if you do not know what they are you have no business being in his presence. When you call upon a man to sell him a telephone, your immediate task is to show that man that his interests are your interests and that you have come to help him. By so doing you not only win the prospect's interest, but you accomplish a still bigger purpose—you place the control of the interview in your own hands.

You should be careful in the early stages of an interview not to make positive statements which will challenge the prospect. A good salesman will make it a rule to ask lots of questions—leading questions. As a result he retains control of the interview at all times. There are some salesmen who cannot use this method successfully. They should, therefore, use the method which fits in best with their own personality. It is not possible to interest everybody with the same arguments or same line of approach.

You will always be the big man in the interview if your knowledge of the telephone and its relations to your prospect's problems are clearly defined in your own mind. The buyer will always be the big man in the interview if you have no definite objective, but go to his office like a beggar looking for a hand-out. Remember from the beginning to the end of the interview that you should forget yourself and concentrate upon the man you are there to help. If you are more interested in yourself than you are in the prospect, you can never hold the prospect's interest.

In the last analysis, salesmanship is selling ideas. When the prospect gives you an order, it is not because he wants the thing; it is because he wants what the thing will do. It is not because he wants the telephone itself, but because he wants what the telephone will do for him.

When you are talking to the prospect, look him squarely in the eyes. The keen, direct, interested gaze of a salesman is the most powerful means of holding attention. You never saw a man who was really in earnest about what he was saying who looked anywhere but squarely into your eyes.

A MAJOR PRESENT-DAY problem occupying the attention of an ever-widening list of telephone company executives is the selling of telephone service on some aggressive, well-defined plan of attack. Instead of searching for capital with which to expand existing plant to take care of the more or less unsolicited applications for telephone service, as was the situation prior to 1929, telephone companies are now seeking to put idle and unproductive plant to use in the face of obstacles unknown five years ago.

As guest of a group of telephone officials that met in Columbus, Ohio, a short time ago to discuss this question of selling telephone service that bears such an important relation to all other problems of the industry, Loren M. Berry, president of L. M. Berry & Co., of Dayton, responded to the request that he give some suggestions from his long and successful selling experience in the telephone directory advertising field.

His talk was received with great enthusiasm and provoked an overwhelming number of requests for copies of his notes. In order to enable telephone men in all parts of the country to make use of Mr. Berry's helpful and practical suggestions, the article which he has written as a result of his informal talk at the Ohio conference previously referred to is presented on these pages of TELEPHONY. It merits your careful reading.

You will always find that when you permit your eyes to wander from the prospect's, his attention will wander, too.

When you speak, speak with confidence. When the voice and the expression of the salesman radiate confidence, it makes the prospect realize that the salesman is sincere and knows what he is talking about. When possible, get the prospect into the habit of agreeing with you; get him to agree with you on trivial points. You will find later, when you present the order blank, that he will agree more readily when you hand him the pencil and ask him to sign.

Of course, there are many times when you should ask outright for the order, in so many words, as, for instance: "Mr. Jones, let us install this telephone for you at once; you will thank me." One of the greatest faults in salesmen is their hesitancy to boldly ask for the order.

An important factor in making calls on prospects is to dodge the temptation to say that this person or that person is not a prospect for a telephone.

No Substitute for Calls

The planned interview is the important thing, but remember that two hundred such interviews will produce double the number of sales of one hundred just as surely as one and one will always make two. Undoubtedly the reason why some salesmen doubt the efficacy of making a great many calls is because so many salesmen plan their work poorly. One of the most successful sales managers in this country uses as his slogan: "There is no substitute for calls." We all know that foot work must be mixed with head work.

Some one person in your telephone organization should read every personal item and every advertisement in each issue of your local newspapers. Every personal item and every article pertaining to local residents should be clipped and mounted on a 3 by 5 inch prospect card to be attached to the master card which the salesman will carry. This news or personal item, or society item, should be dated so the salesman will know when it appeared.

This is useful information to the salesman, and some prospect cards will doubtless have many attachments over a period of months in the way of news items.

A file of all local papers for at least six weeks back should be gone over. Two copies of each edition should always be secured so that the articles clipped on both sides of the page may be pasted up intact on the prospect card.

Every salesman who prepares himself properly and who becomes sold on the fact that he is doing something for the prospect will naturally have enthusiasm, and this quality is contagious in making sales. Take it for granted that the prospect is going to buy, if you know that he has use for a telephone.

So many salesmen approach prospects in a dull, matter-of-fact way, and present their sales stories in a very uninteresting fashion. It never occurs to them that the prospect is yawning to himself as the salesman talks. If you want to get interest, you have to use a little showmanship, and certainly be active, interested and enthusiastic.

My own experience has been that salesmen usually succeed in direct proportion to their willingness to work. The salesman who works twice as hard as another salesman will usually secure twice as many orders. There is no power on earth to hold back a man who makes up his mind to do more work than he is paid for.

In a campaign it is vitally necessary for success that all employes of the telephone company and all salesmen work toward the common goal of selling telephones. As a salesman, remember that no matter how brilliant or how smart you may be, you cannot get to the top in your community without boosters, and the best way to have boosters is to be a booster.

COMING CONVENTIONS

Nebraska Telephone Association, Hotel Lincoln, Lincoln, February 13 and 14.

Iowa Independent Telephone Association, Hotel Fort Des Moines, Des Moines, February 26 and 27.

Wisconsin State Telephone Association, Park Hotel, Madison, March 5, 6 and 7.

Oklahoma Utilities Association, Hotel Biltmore, Oklahoma City, March 12 and 13.

Texas Telephone Association, Baker Hotel, Dallas, March 25, 26 and 27.

Kansas Telephone Association, Hotel Kansan, Topeka, April 10 and 11.

Ohio Independent Telephone Association, Hotel Deshler-Wallick, Columbus, May 1 and 2.

Indiana Telephone Association, Claypool Hotel, Indianapolis, May 8 and 9.

Pennsylvania State Telephone & Traffic Association, Penn-Harris Hotel, Harrisburg, May 14 and 15.

Analyzing the success of the leaders whom you know, you will find that their greatest success is their ability to work with others. Other things being equal, a campaign for new business will succeed or fail according to the ability of those in the field to help one another.

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Bay State Board Reports Gain in Telephones

A net gain of 3,610 telephone stations in the 1934 fiscal year for Massachusetts was reported by the state department of public utilities to the incoming legislature recently. On December 31, 1934, there were 794,103 stations in service in Massachusetts. During the year the telephone and telegraph division handled 1,020 complaints of service requiring special attention. In the fall, Joseph White succeeded William H. O'Brien as director of the division.

The outstanding event of the year was the termination of the New England—Telephone & Telegraph Co. rate case in favor of the company last summer. A slight reduction was made before this in the base rates for residential unlimited PBX trunk lines; service connection and removal charges were reduced later at an estimated saving to the public of $25,000 per year; and decreases were made in certain base rate area charges.

It was expected that various telephone matters of interest to the board will be brought up for hearing before the legislative committees at Boston in the near future, notably in connection with the relations between the New England company and the A. T. & T. Co. and the annual crop of rate bills.

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Suggests Sending of Directories to Legislators

In its latest bulletin to member companies the Minnesota Telephone Association makes a suggestion that companies in other states could adopt with benefit. Says Secretary-Treasurer J. C. Crowley, Jr.:

"May we suggest to the companies operating exchanges in the towns and villages in which your senator or representative resides, that you mail him a copy of your telephone directory. At the same time drop him a note advising him that you are forwarding this directory for his convenience.

"This will assist him in making quick calls to subscribers to your system on any question that your senator or representative may desire to discuss with them. We feel quite satisfied that your senator and representative will appreciate this courtesy on your part."

Who'll Be the Telegraph Angel?

IN THE THEATRICAL business, when some trustful person is found who is willing to put up the money and take the risk, they call him the "angel." There is also another kind of fellow who is sometimes known as the "fall guy," this being one who is selected to get it in the neck when somebody else's plan goes wrong.

The Federal Communications Commission opened on December 3 a hearing on the question of merging the telegraph systems of the country; and the telegraph people went down to Washington, D. C., and spent three days telling the commission all about it. And, from the testimony, it requires no seventh son of a seventh son to glean information that the telegraph industry of the country does not see eye to eye on this question of a telegraph merger; also that any merger of the telegraph system is going to need an angel. An important question is who the "angel" will be.

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THE TELEPHONE INDUSTRY is naturally interested in anything that happens to its first cousin, the telegraph industry. Its interest arises from many reasons. Out of the many, one alone is sufficient cause for Independent telephone men to watch developments in the telegraph business.

It is the possible happenings, under a merger, to arrangements whereby the telephone is the vehicle for the origination of telegraph business, and especially those cases where Independent companies have set up facilities and personnel to cooperate with telegraph companies in the handling of telegraph business.

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IT APPEARS that the commercial wire telegraph business of the United States is handled principally by two companies. One of these companies does around 80 per cent of the business; the other, around 20 per cent. The larger company has offices in some 17,500 places; the smaller, in some 3,400.

The smaller company has been operating at a substantial deficit every year for a number of years; in 1934 (the latest yearly statistics available) it had a loss of about $1,900,000. That same year the larger company had a net profit of around $4,300,000.

Anyone possessed of even a reasonable amount of brotherly love and Christian charity will be full of sympathy for the desire of the smaller company to be merged with the larger; and, it might be added, the sooner the better—for the smaller company.

The FCC seems to be well cognizant of the situation. On January 21 it made a report to Congress on the matter. It said in its report that it thought a merger of the telegraph systems of the country would be a good thing under certain conditions. It recommended to Congress that the Communications Act of 1934 be so amended that it—the commission—would have the power to permit such a merger, provided——.

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IT IS THE PROVISOS in the commission's recommendation that demonstrate the acumen of the commission in dealing with this question of a telegraph merger. The commission says it should be authorized to allow such a merger provided—and only provided—that no employe of either of the present companies shall be dismissed as result of consolidation unless that employe is given certain retirement annuities or dismissal compensation; it also makes other reservations concerning the treatment of employes of the merged company.

It would require the merged company to agree not to diminish the present telegraph service without the commission's permission, and to extend or improve the service if the commission ordered. It requires jurisdiction over not only interstate, but also foreign, rates. It makes the condition that the capitalization of the merged company shall not include anything for property or equipment in excess of that reasonably needed after the merger.

The commission, quite clearly, is not going to be the "fall guy" for anybody in the telegraph industry!

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AS TO THE EMPLOYES, a high official of the smaller telegraph company testified that, in his opinion, practically all the employes of both present companies could be retained in an unification program—although he did go so far as to admit there might be a few casualties among vice-presidents.

But a representative of the larger company said that his organization would not need to look to any competitor for sufficient trained personnel to adequately handle not only the business his company has now, but all the wire telegraph business of the country.

And a representative of an organization of employes of the larger company estimated that there would be a surplus of at least 13,500 employes if the merger of the companies is made.

As to facilities, the testimony of representatives of the larger company is to the effect that that company does not need any of the plant and equipment of its competitor; that it could handle all the wire telegraph business in the United States with its own present plant and facilities.

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IT SEEMS CERTAIN that, if a telegraph merger is made in the United States, somebody has to be the angel. You cannot junk 20 million dollars or so of telegraph plant without somebody footing the bill, nor can you extend telegraph facilities into unprofitable areas

without operating losses. Since substantial economies could be effected only by retiring a large number of employes, one of suspicious turn of mind might infer that the public, through higher rates, would have to foot the bill.

Although there is no noticeable public clamor for a telegraph merger there would probably be no public objection to it if consummated under all the safeguards the commission proposes, provided it is not made at the expense of the telegraph users. But if the public should be made the angel, the resulting outcry would fill the air around Washington and resound to the high heavens.

The same thing goes for employes; 13 thousand or so people are not going to be retired from their jobs on any basis without making the welkin ring. No annuity or retirement pension is ever as good as a job. It is pertinent also to remember that a time when the vast resources of even government itself are being used in all possible ways to lessen unemployment, is naturally a poor time to sponsor any plan that would put a lot of people out of work.

The commission has taken the first step; if Congress approves its recommendations, the next move will be up to the telegraph companies. If such move is made, the developments will be interesting. They might prove, for instance, that the best possible stimulus to faster and cheaper telegraph service and to the advancement of the art, is continued competition.

Joint Resolution Provides For Extensive FCC Investigation

FCC INVESTIGATION extended to include all inter-state companies in joint resolution introduced in Congress last week. Appropriation of $750,000 provided to cover exhaustive investigation of capital structures, inter-corporate relations and rates; effect of monopolistic control, of mergers and of competition

A JOINT RESOLUTION authorizing and directing the Federal Communications Commission to investigate and report on the American Telephone & Telegraph Co. and all other companies engaged directly or indirectly in telephone communication in interstate commerce, including all companies related to any of these companies through a holding company structure or otherwise was introduced in Congress on March 24 by Senator Wheeler, chairman of the Senate interstate commerce committee and Representative Rayburn, chairman of the House interstate commerce committee.

An appropriation of $750,000, as provided for in the joint resolution, would allow the FCC to continue and enlarge upon its announced investigation of the A. T. & T. Co. and subsidiary and affiliated companies.

The resolution directs the FCC to investigate all interstate telephone companies with reference to their corporate and financial structures; inter-company service contracts and all transactions between affiliated companies; reasons for failure to reduce rates during the depression; effect of monopolistic control upon rates, upon methods of competition and upon service; the effect of mergers; accounting methods with particular reference to depreciation; methods of competition with other companies or industries; whether or not propaganda has been used to influence public opinion or legislative action.

The first, second and fourth sections of the resolution are presented in full, as follows:

Section 1: Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, that it is necessary, in aid of legislation by the Congress and for the use of governmental agencies, including state regulatory commissions, for the information of the general public, as an aid in providing more effective rate regulation, and for other purposes in public interest, that accurate and comprehensive information be procured and compiled regarding the American Telephone & Telegraph Co. and other telephone companies.

Section 2: The Federal Communications Commission is hereby authorized and directed to investigate and report to the Congress on the following matters with respect to the American Telephone & Telegraph Co. *and all other companies engaged directly or indirectly in telephone communication in interstate commerce,* including all of their subsidiary, affiliated, associated and holding companies, and any other companies in which any of them have any direct or indirect financial interest, or which have any such interest in them, or in which any of their officers or directors hold any office or exert any control, or whose officers or directors hold any office or exert any control in them—

(a) The corporate and financial history, and the capital structure and the relationship of such company and of its subsidiary, affiliated, associated, and holding companies, including the determination of whether or not such structure may enable them to evade state or federal regulation or taxation, or to conceal, pyramid, or absorb profits, or to do any other act contrary to the public interest.

(b) The extent and character of intercompany service contracts and all transactions between the telephone companies and their subsidiaries, affiliated, associated, or holding companies, and particularly between the American Telephone & Telegraph Co. and the Western Electric Co. and other manufacturers of electrical communication equipment; the methods of publishing telephone directories and placing and charging for advertising therein; the cost of and sale prices of telephone equipment, material, or devices to telephone operating companies or users; the profits upon such sales and the effect of such sales upon the rates or upon the rate base of operating companies when used as a basis for telephone charges in the various state or in interstate commerce; and the probable savings to telephone operating companies and the public by purchasing equipment under a system of competitive bidding.

(c) The reasons for the failure generally to reduce telephone rates and charges during the years of declining prices; and the extent, if any, to which local subscribers or the users of toll service have borne the cost of the research developments for telephone equipment and appliances, radio, motion picture and other inventions, including the maintenance and support of Bell Telephone Laboratories, Incorporated.

(*Concluded on page* 34.)

Sources of Direct-Current Energy In Telephone Systems

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FIFTH ARTICLE in series on Fundamental Principles of Electricity involved in operation of telephone equipment and apparatus. Primary and secondary cells and theory underlying their operation

IN THE PRECEDING articles of this series the flow of direct current in series and parallel circuits and various methods of measurement were discussed. It is the purpose of this article to consider the sources of direct-current energy commonly used in telephone systems.

Before further considering these sources, however, it will be well to review certain fundamentals. First of all, an electric current (composed of electrons) flows through the resistance of a circuit, because an electromotive force or voltage *forces* it through. The relations are expressed by Ohm's law, $I = E/R$.

When this current flows through a resistor, power is dissipated, the power being given by the relation $P = I^2R$. Now, power is the rate of doing work; so over a period of time, the work done (if the current turns a motor) or the power dissipated (if the current heats a resistor) is $W = Pt = I^2Rt$. The units involved, and further information on this subject is included in the first article of this series (TELEPHONY, January 5).

One of the fundamental laws of nature is that *energy cannot be created or destroyed*, but it can be transformed. For example, a storage battery converts chemical energy into electrical energy, and this in turn is converted by the starter into mechanical energy to crank an automobile engine.

Among the sources of direct-current energy in telephone systems are included the dry cell, the storage battery, the direct-current generator, the thermocouple, and certain types of photo-electric cells. For various reasons, it is not advisable to consider all of these at present. The following discussion will, accordingly, be limited to primary cells and secondary cells, such as dry cells and storage batteries.

Much detailed information regarding the construction and use of these already exists, and it is not the purpose of this article to duplicate or extend this information. The purpose is rather to briefly present the principles of operation and to stress the action of these devices in circuits.

Primary Cells: Primary cells were the first sources of direct-current electrical energy, and many types of primary cells have been developed. A *primary cell* may be considered as a cell in which the electrical energy is produced by chemical action, the action *not being reversible* to any great extent. An illustration will make this clear:

Metal	Voltage
Zinc	—0.770
Iron	—0.344
Nickel	—0.228
Lead	—0.151
Copper	+0.329
Silver	+0.771

Table No. 1. Metals and Their Voltages Resulting from the Chemical Action with Acid.

The dry cell is a primary cell. As it supplies electrical energy, it is consumed chemically until it is useless and is then thrown away. The storage battery is a secondary cell. It also supplies electrical energy from chemical action, but when discharged, it can be recharged by passing an electric current through it in an opposite direction.

The simplest primary cell consists of two pieces of unlike metal in a solution of acid. For example, if a piece of copper and a piece of zinc are placed in a solution of dilute sulfuric acid, an electromotive force of about 1.1 volts will exist between the two pieces of metal. In general, any two dissimilar metals and any acid solution can be used, but, of course, some combinations are more satisfactory than others. Some idea of the possible combinations can be obtained from Table No. 1, shown above, which gives the metals and the voltages resulting from chemical action between them when they are placed in a weak acid solution.

Answers to Problems in Fourth Article, "Measurements in Direct Current Circuits"

The answers to problems, concerning principles of electricity, given in fourth article of this series entitled "Measurements in Direct Current Circuits"—published in TELEPHONY of January 26—are as follows:

8. 1728.27 ohms.
9. 0.005015 ohm.
10. 9.73 ohms. Connect as in Fig. 4-A, because the current through the voltmeter will be only a small proportion of the total current.
11. 3,745,000 ohms.
12. 93,600,000 ohms. (The leakage paths are in parallel. Thus, one mile has less leakage and hence better insulation resistance than 25 miles.)

As previously mentioned, strips of copper and zinc in dilute sulfuric acid give an electromotive force or emf of $+0.329 - (-0.770) = 1.099$ or 1.1 volts. In other words, the voltage between any two metals is equal to the *difference* between the voltages given in table No. I. The difference is the *algebraic* difference; to subtract two algebraic quantities, change the signs and add.

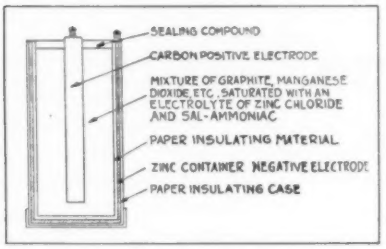
SEALING COMPOUND
CARBON POSITIVE ELECTRODE
MIXTURE OF GRAPHITE, MANGANESE DIOXIDE, ETC., SATURATED WITH AN ELECTROLYTE OF ZINC CHLORIDE AND SAL-AMMONIAC
PAPER INSULATING MATERIAL
ZINC CONTAINER NEGATIVE ELECTRODE
PAPER INSULATING CASE

Fig. 1. Cross-Section Showing Construction of a Typical Dry Cell.

In the cell just considered, the terminal connected to the copper plate will be positive, and the one connected to the zinc plate will be negative. When the two terminals are connected to an external circuit, the emf of the cell will force a current through the circuit. The zinc electrode will be consumed during operation, and soon the cell will be useless.

The electrical energy comes from the chemical action between the zinc and the electrolyte or acid. In general, then, the metals nearest the top of table No. I will be negative and those nearest the bottom will be positive. The negative electrode or plate is consumed in the process.

The emf just mentioned is somewhat theoretical in that it is the terminal voltage measured *when the cell is delivering no current*, or it is the *open-circuit voltage*. When a cell is delivering current, gas (usually hydrogen) is given off at the positive electrode. This gas may cover the surface of this electrode so that the gas and not the metal is in contact with the surface. This is known as *polarization*, and causes two bad effects:

First, it lowers the emf produced between the two electrodes, and hence lowers the terminal voltage. *Second*, it causes the internal resistance of the cell to be higher.

Many primary cells contain a *depolarizer* which reacts with the hydrogen and prevents its accumulation. Certain primary cells are designed for *continuous* service, and others are for *intermittent* service, the amount of the depolarizer placed in the cell sometimes determining the use.

A single unit, usually consisting of a positive and a negative electrode or plate in an electrolyte, is a *cell*. A number of such cells connected together is a *battery*.

The Dry Cell: The dry cell is by far the most common type of primary cell, and is the only one which will be considered. It is not a *dry* cell as the name implies, but is a primary cell consisting of two dissimilar electrodes in an electrolyte.

A typical dry cell is illustrated in Fig. 1. The negative electrode is a zinc can or container. The positive electrode is a carbon rod placed at the center, and spaced from the zinc by a mass of porous material consisting largely of graphite and manganese dioxide. This porous material is saturated with a solution of zinc chloride and sal ammoniac which acts as an electrolyte. Since the electrolyte is thus held and cannot spill, the term "dry" cell is applied.

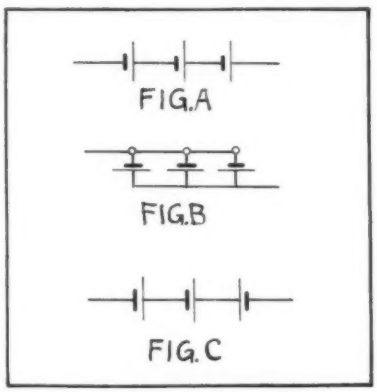

Fig. 2. Connections of Dry Cells, Illustrating Voltage Differences.

There must be a separator of some type to keep this saturated material from contact with the zinc. This is usually a layer of absorbing material, similar to blotting paper, lining the zinc can. The top of the can is sealed, and the outside of the zinc can is covered with cardboard to prevent contact between the zinc cans when several dry cells are stacked together. When delivering electrical energy to a circuit, the zinc is gradually consumed by the chemical action, and the dry cell eventually becomes useless.

Dry cells are designed for several types of service, and it is important that they are used for the particular service for which they are designed. For example, the cells used in radio "B" and "C" batteries are made for delivering very low currents of a few milliamperes, and they should not be used where considerable current is needed. Such batteries should be tested with high-resistance voltmeters if it is desired to ascertain their condition.

The dry cell illustrated in Fig. 1 is made for two general classes of service: *First*, there is a type made for delivering relatively heavy currents, such as for gas-engine ignition purposes. *Second*, there is the type used in telephone service, which has a smaller rated current output.

A new dry cell has a terminal voltage of from about 1.3 to 1.5 volts. This voltage decreases with age, and also with use. There is a small amount of internal resistance within a cell, usually about 0.2 to 0.3 ohm. This resistance *increases* with age and with use.

The voltage alone is not an indication of the condition of a dry cell such as shown in Fig. 1. An old cell may show a rather high voltage, but it would only deliver an appreciable current for a very short time. Thus, one telephone organization rejects from service all dry cells which will not sustain a current of 0.125 ampere through 5 ohms for 5 seconds.

Connections of Dry Cells: Dry cells are usually connected in series as in Fig. 2-A, or in parallel as in Fig. 2-B. In the first instance, the total voltage is the sum of the voltages of each cell. The current-carrying capacity is the same as for one cell.

For the parallel combination the voltage is the same as for one cell, but the current capacity is the combined capacity of each cell. Suppose that by accident one of the cells of Fig. 2-A were reversed as shown in 2-C. Then, the total voltage will be the voltage of two cells minus that of the third cell which is bucking the other two.

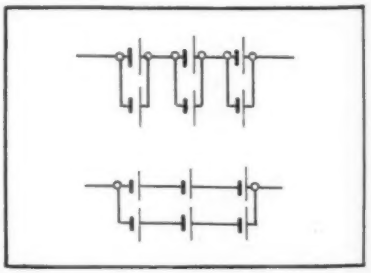

Fig. 3. Arrangements of Dry Cells for Higher Voltage and Higher Current Capacity.

Where a higher voltage and a higher current capacity than given by the foregoing combinations are desired, series-parallel connections may be used. Two such combinations are shown in Fig. 3. Each of these

gives the same voltage and current capacity, but the first arrangement is more satisfactory. With this system, the early deterioration of one cell does not put a high resistance in one-half of the entire circuit as it does with the second set of connections.

Storage Cells: As a storage cell is discharged, chemical changes take place in the electrodes, or plates as they are usually called. As previously

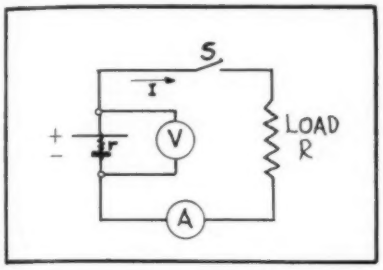

Fig. 4. Illustration of Relations of Battery Voltages Under Different Conditions.

mentioned, with the storage cell the action is reversible; that is, by passing a current through in the opposite direction, the cell is returned to its original condition.

There are two general types of storage cells. The *first* is the lead-acid cell, and the *second*, the nickel-iron or Edison cell. Some makes of the lead-acid cell are known as "Chloride accumulators," from a trade process formerly used in the manufacture of battery plates. Of these two types of cells, the lead-acid type is used almost exclusively in telephone plants. It will, therefore, be treated more fully than the Edison cell.

Lead-Acid Storage Cells: This cell is so extensively used in telephone plants and so familiar to telephone workers that it is only necessary to briefly describe it here. It consists essentially of a positive electrode composed of one or more plates of lead peroxide (PbO_2) and a negative electrode of one or more plates of spongy lead (Pb). The plates are held apart by separators, and the whole assemblage is immersed in a dilute solution of sulfuric acid (H_2SO_4).

The chemical actions within a storage cell are not so simple as usually considered, but the accepted explanation is represented by the following:

$$PbO_2 + Pb + 2H_2SO_4 \underset{\text{Charge}}{\overset{\text{Discharge}}{\rightleftharpoons}} 2PbSO_4 + 2H_2O$$

That is, when a battery is fully charged, the positive is a dark brown plate of lead peroxide, PbO_2, and the negative is a dark gray plate of spongy lead, Pb. During discharge, electrical energy is delivered to the circuit, the plates are acted upon chemically, *each* becomes lead sulfate, $PbSO_4$, and the acid becomes more dilute, approaching water, H_2O.

During charge the action is reversed. Electrical energy is absorbed and the battery is returned to a charged condition. Of course, this process is not perfect, and the watt-hour efficiency is about 60 to 70 per cent.

As mentioned, the electrolyte becomes more like water as the cell is discharged. A hydrometer can, therefore, be used to indicate the condition of charge of a cell. The hydrometer is merely a "weighing" device which compares the electrolyte with pure water.

A battery should not be permitted to stand in a discharged condition, because the lead sulfate formed by the normal discharge may harden. This may damage the plates and separators and is difficult to reconvert when the battery is charged. A long charge at a very low rate is a good treatment for such a battery.

Edison Cells: Edison cells are especially adapted for portable use, and are seldom used in telephone central offices. The chemical theory of this type of storage cell is very involved and not well understood. The positive plate is of nickel peroxide held in steel tubes, and the negative plate is of iron oxide packed in steel pockets.

The whole assembly is placed in a steel container, is very strong, and will withstand hard use. The electrolyte is potassium hydrate in water. Its specific gravity does not vary appreciably during charge and discharge.

Although the Edison cell is rugged, long lived, and not damaged by excessive charge and discharge, it has certain characteristics which do not well adapt it for central-office telephone batteries:

First, its internal resistance is comparatively high, thus making the terminal voltage vary widely with charge and discharge. *Second*, the electromotive force per cell when fully charged is only about 1.4 volts compared with 2.1 volts for the lead-acid type.

Third, the voltage variations during discharge are great. In fact, these variations are so large that the "open-circuit" voltage as read by a voltmeter is used to indicate the condition of charge.

Batteries as Circuit Elements: In the preceding discussion, very little has been said regarding the operation of dry cells and storage batteries in circuits. In considering this subject two factors should be clearly kept in mind:

First, a dry cell or battery has a certain generated electromotive force or emf, and this is approximately equal to the "open-circuit" voltage as read by a high-resistance voltmeter. The quotation marks are used because it really is not an open-circuit voltage, as the voltmeter across the terminals actually closes the circuit and takes some current.

Second, the battery contains a certain amount of internal resistance, due to the electrolyte, etc., and the battery must do work in forcing current through itself.

These relations are shown in Fig. 4. When the cell is supplying electrical energy the load as shown, the current will be $I = E_o/(R + r)$, where E_o is the open-circuit voltage indicated by the voltmeter, V, when the switch, S, is open; R is the resistance of the load, and r is the internal resistance of the battery.

When thus delivering energy, there will be an IR drop in the battery, and the closed-circuit voltage read by the voltmeter, V, will be less than the open-circuit voltage by this IR drop. That is, $E_c = E_o - Ir$. Under these conditions energy is dissipated within the cell, and this tends to raise the temperature of the cell. The

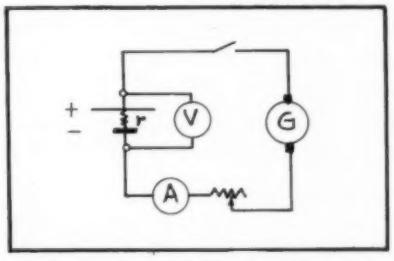

Fig. 5. Relations of Storage Battery Voltages With Consideration of Changing Conditions.

power delivered to the external circuit is $P = EI = E_cI$. The value E_c and not E_o is used, because E_c is the voltage *across the load*, R, when the current flows.

The discussion just given applies equally well to primary or secondary cells; that is, to dry cells or storage batteries. But with storage batteries, the conditions when charging must also be considered. The d-c charging generator, G, of Fig. 5 must force a current back through the storage cell against: *First*, the electromotive force or open-circuit voltage of the

Corrected Answers for Problem No. 2

The answers published in the January 19 issue of TELEPHONY for Problem No. 2 of the article in this series entitled, "The Solution of Direct Current Circuits," were incorrect. Here are the correct solutions:

A. 58.95 ohms.

B. 29.47 ohms.

C. 253.87 ohms.

D. $I = 24/253.87 = 0.0946$ ampere.

E. 0.0473 ampere.

F. The voltage at the subscriber's sets will be equal to IR, where R represents the equivalent resistance of a subscriber's set and I is the current through it. Thus, $0.0473 \times 58.95 = 2.787$ volts. From this the drop through the transmitter must be subtracted. Thus, $2.788 - 2.365 = 0.423$ volt, and this is the voltage across the parallel part of the telephone set consisting of the induction coil primary in parallel with the secondary, the ringer, and the receiver. The current through the receiver is $I = 0.423/1494 = 0.000283$ ampere.

cell; and *second*, through the internal resistance of the cell.

Thus, if E_g is the generator voltage, R a rheostat for adjusting the charging current, and r is, as before, the internal resistance of the storage cell, the charging current from the generator as indicated by the ammeter, A, will be $I = (E_g - E_o)/(R + r)$. That is, since the emf, E_o, of the battery opposes E_g, the generator voltage, the *difference* in these two voltages is all that is effective in forcing a charging current through the circuit.

The current through the storage cell is now reversed, and the Ir drop within the cell now *adds* to the emf. The closed-circuit voltage is now *greater* than the open-circuit voltage by this Ir drop, and therefore is $E_c = E_o + Ir$.

Summary: Primary cells such as dry cells, and secondary cells such as storage batteries, are extensively used in telephone plants. These cells convert chemical energy into electrical energy. They generate an electromotive force by chemical action which forces a current of electricity through a circuit.

The chemical action in primary cells consumes the active materials and the primary cell is discarded when it becomes weak. In a storage battery the chemical action is reversible, and the battery can be restored to its original condition by charging.

The internal resistance of a cell is an important factor in determining its operation in circuits.

Problems:

13. A primary cell consists of an electrode of iron and one of copper in a weak solution of sulphuric acid. What will be the emf, or voltage, and which electrode will be positive?

14. A circuit is connected as in Fig. 4. $E_o = 6$ volts, $r = 0.05$ ohm, and $R = 0.75$ ohm. Find the current, I, the closed-circuit voltage, E_c, and the power delivered to the load resistor, R. Also calculate power lost in internal resistance of battery.

15. If the efficiency equals the total power delivered to the load divided by the total power generated, calculate the efficiency of the circuit of problem 14.

16. A circuit is arranged for charging as in Fig. 5. If $E_g = 20$ volts, $E_o = 6$ volts, and $r = 0.05$ ohm, what must be the value of R to hold the charging current to 10 ampere?

17. Calculate the closed-circuit voltage, the power dissipated in the internal resistance, and the power actually producing the chemical changes when the battery of problem 16 is being charged at 10 amperes.

Work out the answers to these questions and hold them to compare with the correct answers. These will be published with the next instalment of this series of articles.

LOSS

By MISS ANNE BARNES,

Traveling Chief Operator, Iowa Independent Telephone Association, Des Moines, Iowa

Loss! Not a cheerful word, is it? What gray memories it may recall to many. Some are sad, lonely, disappointing happenings which often leave an aching void in our thoughts when we recall them. The average adult has suffered many losses no matter what the circumstances of his life may be—loss of friends, money, health, or trinkets valuable because of worth or personal association.

Then there are other losses, perhaps not so serious, and yet they concern things which contribute toward a richer, fuller life for us and for those with whom we associate.

I have a friend who has never taken a vacation because of the money it would take, although she is financially well-off. She is missing so many of the beauties of nature that literally cover the earth. Possession of money has caused her great losses other than money. Sometimes, she goes down to the bank, gets her box, goes into a little closet, and looks over her precious gems, beautiful only after a ray of light illuminates them. I feel sorry for this wealthy woman who enjoys so little of the luster of her gems for fear of losing them. So they remain colorless, lifeless gems most of the time. She loses much of their *beauty*. Was it intended only for her?

There is another loss to humanity—many a *truth* in *silent thought* is never expressed to the world. Like the woman with her gems, it is hidden back in the mind of its possessor where it radiates no light of pleasure or help to anyone else. *Truth* is *illuminated* only when *shared*.

Will you think of this, operators, when attending your next state district conference? In planning conference programs, a few folks are selected who are not only well-posted but able to give to those attending many helpful suggestions. They are for you—and you—and you. Your possessions. Don't enjoy and think of them only while at the meeting and then lock them up in your mind from the other operators who could not attend. District conferences would lose much of their purpose if they were intended for just those attending the meetings and for use only at the meetings.

Obituary Notes From the Field

Carl W. Schafer, manager of the Chicago office of the Stromberg-Carlson Telephone Mfg. Co., died suddenly on January 23 at his home in Oak Park, Ill. Mr. Schafer had worked that evening in the office and appeared in usual good health. He had just reached his home and was hanging up his overcoat when he had a stroke, expiring almost instantly.

Mr. Schafer was one of the oldest employes of the Stromberg-Carlson company in point of service, his first connection dating back to 1899 when he entered its employ in Chicago as shipping clerk. His brother, Henry, who is well-known to the older Independent telephone men, was the company's sales manager at that time.

During the years that followed, Mr. Schafer advanced from one position to another. Shortly after the factory was moved to Rochester, N. Y., in 1904, he was transferred to that city where he acted as sales manager. About 1908, Mr. Schafer returned to Chicago and from 1911 to 1921 was the assistant manager in Chicago. He was acting manager until May, 1925, when he became manager, which position he held at his death.

In the years that he was connected with Stromberg-Carlson, Mr. Schafer became widely-known in the Independent field in the Middle West and his many friends will mourn his sudden demise.

Mr. Schafer was born in Ida, Mich., May 16, 1875, and his remains were taken there for interment. He is survived by a son, one sister and two brothers.

Philander Norton, assistant to the president of the Bell Telephone Laboratories, died on January 10 of pneumonia at Doctors Sanatorium, Port Washington, L. I. He was 53 years old.

Mr. Norton was a graduate of Princeton University, class of '07.. He received a Master of Arts degree and an engineering degree from that institution. In 1910 he entered the electrical organization which eventually merged to become the Bell Telephone Laboratories, Inc.

His first work was in the investigation and design of ringing systems for party telephone lines. He branched later into the study of other devices for telephones and for several years he was in charge of a group of engineers concerned with the development of protective devices for telephone line. A protector now installed in connection with millions of telephones was evolved.

During the World War Mr. Norton was engaged in the production of vacuum tubes for the government and later was one of a group working on the electrical detection of submarines at the station at Nahant, Mass.

Mr. Norton became assistant to F. B. Jewett, president of the Bell Telephone Laboratories, shortly after the company's organization. In 1920 the responsibility was vested in him of testing new models of telephone apparatus, and in 1929 he was appointed editor of The Ball System Technical Journal.

His home was at Port Washington, and in the past 17 years he had taken an active part in the community's affairs. He was a member of the American Institute of Electrical Engineers and the Princeton Engineering Association.

John J. Ghegan, who introduced the telephone in Mexico after previously serving as manager of the first telephone exchange in Newark, N. J., died on January 9 at his home in East Orange, N. J., following a brief illness. Mr. Ghegan was 83 years old.

Born in Ireland, he came to this country as a young man. He became an operator for the Western Union Telegraph Co. in Philadelphia. He later was transferred by that company to Newark, where in 1877 he became manager of the Gold Stock Telephone Co., a branch of the Western Union, which had just entered the telephone field. When Mr. Ghegan started operations of the Gold Stock company, the New York telephone directory contained 25 names and wires were strung over housetops. The company later changed its name to the Newark Telephone Exchange.

In 1881 the American Bell Telephone Co. won a suit for infringement of patents in which Western Union was the defendant. The latter company agreed to withdraw from the telephone field. The Bell company purchased the equipment of the Newark exchange. Mr. Ghegan continued with the Western Union as manager of the Newark district.

In 1883 he became vice-president and general manager of the Mexican Northern Telephone & Telegraph Co., and it was through Mr. Ghegan's efforts that the first telephone exchanges were installed in Mexico. In 1885 he returned to the United States and entered the employ of J. H. Bunnell & Co., New York manufacturers of telephone and telegraph equipment, as technical adviser. In 1903 he became president of the Bunnell company and served in that capacity until 1926, when he retired.

Bayard L. Kilgour, Sr., of Cincinnati, Ohio, president of the Cincinnati & Suburban Bell Telephone Co., and the Citizens Telephone Co. of Kentucky, died suddenly of a heart attack early Monday, January 28, at the age of 65.

Mr. Kilgour apparently had been in good health. On Thursday night, January 24, he attended a party given in Cincinnati by the Telephone Pioneers of America, of which he was the national president. He was at his office on Saturday.

Born on December 12, 1869, he entered the service of the Cincinnati company on April 29, 1901, and succeeded his

President Bayard L. Kilgour, Sr., of Cincinnati & Suburban Bell Telephone Co., Cincinnati, Ohio, Died Suddenly from a Heart Attack, January 28.

father, John Kilgour, as president on December 22, 1913. He received his education at Cheltingham Academy, near Philadelphia, Pa.

Surviving are a widow, Mrs. Mary Andrews Kilgour; two sisters, Mrs. Briggs Cunningham and Mrs. A. B. Heyl, and a son, Bayard L. Kilgour, Jr., vice president and assistant general manager of the two telephone companies.

George A. Hamilton, a retired consulting engineer of the Western Electric Co. of New York and an honorary and charter member of the American Institute of Electrical Engineers, died January 10 at his residence in Elizabeth, N. J.

Born in Cleveland 91 years ago, Mr. Hamilton became interested in telegraphy at an early age. After eight years of practical experience, he became assistant to Prof. Moses G. Farmer of Boston, Mass., with whom he participated in many important experiments and investigations in the field of telegraphy. Later, with Garritt Smith, he built the first quadruplex telegraph circuit to be operated in this country.

After introducing the system abroad, he returned to this country and took charge of fine electrical instruments for the Western Electric Co., which position he held until he retired in 1909.

Mr. Hamilton was a member of the British Institution of Electrical Engineers and La Societe Francaise des Electriciens. He was treasurer of the American Institute of Electrical Engineers for many years.

Depreciation Accounting

By ALVIN W. SPONAGLE
C. P. A., Reading, Pa.; Director, Conestoga Telephone & Telegraph Co., Birdsboro, Pa.

PRESENT METHOD of determining telephone plant depreciation used by Bureau of Internal Revenue. Reserve found inadequate in majority of returns. Reserve of more than 40 per cent must be adequately defended. High rate sustained by definite replacement program

AFTER a telephone company's income tax return has been examined by a local internal revenue agent, the return is forwarded to the Bureau of Internal Revenue at Washington, D. C., and there receives the scrutiny and examination of the valuation division. The personnel of this division is composed of a large number of competent engineers and the income tax return is assigned to an engineer who is thoroughly familiar with telephone companies.

The engineer, upon examining the return, first determines whether or not the fixed assets as shown, and also as indicated in the depreciation schedules as submitted in compliance with Treasury decision No. 4422, are reflected at cost prices. If he is satisfied that the fixed assets are reflected at cost prices, his first step is completed.

If, on the other hand, the assets are not shown at cost prices but at appraisal figures, he determines the basis of the valuation. If he finds that the appraisal is shown at present reproduction costs, less accrued depreciation, he will ignore the appraisal figures entirely and attempt to adjust the assets to a historical cost basis.

After the fixed assets are adjusted to a historical cost basis, the engineer will refer to the accrued depreciation account as shown on the schedules submitted and determine if the reserve for depreciation at the earliest date shown has been adequate. In the majority of cases, he will find that the books had been opened on an appraisal basis and that the status of the appraisal had been previously determined. He will then accept these figures as correct.

However, in numerous instances he will discover that the reserve for depreciation, when it first appeared on the books of the company, was grossly inadequate. He will then adjust the reserve for depreciation account in his work papers to reflect the reserve account at the proper figure.

Inadequate Reserve in Majority of Returns

The engineers in the valuation division find that practically 99 per cent of the appraisals submitted do not contain adequate provision for accrued depreciation and will adjust the reserve for depreciation account to its proper figure by means of charts, graphs, and statistics that the valuation division has compiled with the cooperation of engineers and statisticians of some of the largest telephone companies in the country.

The engineer in the valuation division determines the average rate of growth of the telephone company by means of the additions to fixed capital each year. With the aid of his charts, he can compute the proper amount for the reserve for depreciation account when it first appeared on the books of the company.

If, for example, the engineer finds that the reserve for the depreciation account, when it first made its appearance on the books of the company, only contained a 12 per cent or 15 per cent reserve, it is obvious to him that this amount was insufficient. After allowing, for example, for a 7½ per cent growth, he will find that the reserve for depreciation account, when it first appeared on the books, should have been, say, 37 per cent, based on a composite rate of 5 per cent.

At this point, the engineer now has the assets on a proper cost basis. The reserve for depreciation account has been properly adjusted as of the date when it first made its appearance.

His next step is to examine the retirements that have been actually made by the telephone company, as shown in the depreciation schedules submitted. The retirements for each class of equipment are considered separately. After carefully averaging the annual retirements of property, the engineer will see how the retirements of fixed assets compare with the depreciation actually charged off by the telephone company and reflected in the income tax return.

If he determines that the depreciation claimed is in excess of the retirements, as in numerous cases he does, the reserve for depreciation account at the end of the year under examination will invariably be too high. He will consequently revise the rates so that the reserve for depreciation at the close of the year will not be excessive.

The valuation division permits the deduction for depreciation only in proportion to retirements, both past and estimated future. The division claims, and justly so, that in most instances the physical condition of the property remains practically the same from time to time and that the retirements which are made should continue to keep the property in that condition.

Excessive Reserve Investigated

If the reserve for depreciation account becomes in excess of 40 per cent of the fixed capital in service at the close of the year, it indicates to the engineer that the depreciation claimed is excessive. Consequently, the Bureau of Internal Revenue (valuation division) will send a letter to the company in question reading substantially as follows:

> In view of the large depreciation reserve and the high rate of depreciation claimed, it is believed that a substantial reduction should be made in your rates of depreciation. It is accordingly proposed to reduce your composite rate to 3 per cent.
>
> Before proceeding with any adjustment, however, it is desired to afford you an opportunity for supporting the rates of depreciation which you con-

(*Concluded on page* 24.)

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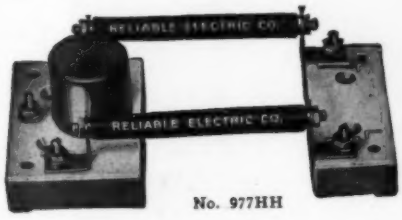

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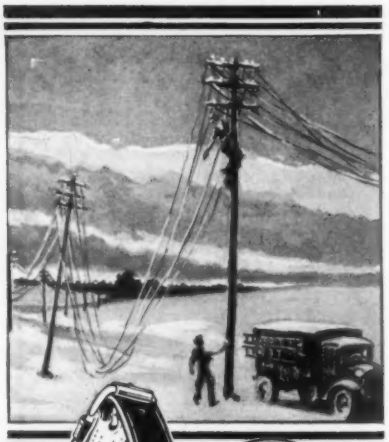

Lines Down!

KLEINS

A tangle of twisted wires and insulators, a maze of flattened, broken poles. Emergencies like these call for the utmost in strength of men—the utmost in quality of materials. Under the strain of extraordinary conditions where interrupted service demands immediate action despite overwhelming difficulties, Klein tools and Klein equipment does its full share, accepting the responsibility of linemen's safety.

Foreign Distributor: International Standard Electric Corp., New York

Distributed through jobbers

The four pamphlets listed below will be sent without charge to anyone interested. Check the ones you want.

☐ Safety for the Pole Climber.
☐ Specifications on Linemen's Belts and Safety Straps.
☐ The Safety Factor on Linemen's Leather Goods.
☐ Pocket Tool Guide.

Mathias KLEIN & Sons
Established 1857 — Chicago, Ill. U.S.A.

3200 Belmont Avenue, Chicago, Illinois

(*Concluded from page* 22.)

sider applicable to your physical properties. Information regarding retirements of property, estimates of the remaining useful life made by engineers, plant superintendents or others conversant with your property, or any other information bearing upon the determination of the proper rate of depreciation may be submitted.

Your case will be held in abeyance 20 days pending your reply to the suggestions set forth in this letter.

Even though the majority of telephone companies had previously determined the depreciation rates on each class of depreciable property separately, the valuation division not only considers the matter from that angle but also from the standpoint of a comparison of the total depreciation to the sum of all depreciable assets.

The information and data requested in the typical letter shown should be promptly obtained and submitted personally, if at all possible, to the Bureau of Internal Revenue (valuation division) by an official of the company, or an agent, who has been properly authorized by a power of attorney.

File Outline of Replacement Program

The writer has found from his experience in handling cases of this kind that it is practical and advisable to not only furnish the specific information and data requested, but also to furnish the future replacement program of the company.

In a most recent case settled, the valuation division permitted a telephone company to submit its replacement program for each of the years 1935 to 1940, inclusive. In this particular instance, the retirement program included the conversion to automatic equipment of magneto type central office and substation equipment of one exchange in 1935, another in 1937, and also an additional one in 1939, and the depreciational one in 1939, and depreciation rates were increased accordingly.

The depreciation rates used by this particular telephone company in the past several years had been unusually high, and a still further adjustment had to be made on account of an appraisal that had been placed upon the books of the company in 1921, wherein the reserve for depreciation account had to be adjusted in order to take care of an inadequate depreciation reserve at that time. Notwithstanding these facts, the company was able to sustain a depreciation rate on central office equipment of 6¼ per cent and also a rate on subscribers' station equipment of 5½ per cent.

After the data requested by the Bureau of Internal Revenue have been obtained, it is advisable to have a conference with the engineer who has been assigned to the case. He will examine the data and proposals submitted and discuss the subject with the properly authorized official or agent of the company.

The new rates of depreciation will be computed and if it is found that the rates used in the past have been too low, the engineer will allow a higher rate. Likewise, if it is determined that the rates used in the past have been too high, the rates will be revised downwards. The engineers in the division are extremely fair and courteous and will give each proposal its proper consideration.

Every telephone company should watch its reserve for depreciation account very closely so that it does not exceed 40 per cent of the depreciable fixed capital at the close of any year. In rare cases a larger rate may be justified due to unusual conditions, such as the estimated future installation of an extremely large amount of cable to replace open wire, or the erection of a new exchange building and the installation of new central office and substation equipment.

Retirements or replacement of property should be charged against the reserve for depreciation account, no matter how small the items may appear. So many telephone companies in the past have charged the cost of new replacements against the reserve for depreciation account. The proper plan is to charge the cost of the old property that has been replaced to the reserve for depreciation account and credit the same amount to the plant account.

The cost of the new property should be charged to the appropriate fixed capital account. In most cases, the cost of the new assets is more than the cost of the old ones replaced and, therefore, if the new items are charged to the fixed capital account, a more proper depreciation base will result.

Cautions Companies on Improper Practice

In some cases, telephone companies have replaced numerous sections of pole lines and charged the replacements to the maintenance account. This practice is grossly improper and will tend to inflate operating costs. It will also work to a great disadvantage in securing a proper depreciation rate on pole lines in the future, because the retirements are not properly shown as such.

A TIMELY SUGGESTION

GRAY TELEPHONE PAY STATIONS

If you want more revenue, install Gray Telephone Pay Stations in the public places in your territory.

Gray Pay Stations have proven their ability to earn money for any company, large or small.

GRAY TELEPHONE PAY STATION CO.

HARTFORD, CONN.

Order Direct or Through

AMERICAN AUTOMATIC ELECTRIC SALES CO., Chicago
KELLOGG SWITHBOARD & SUPPLY CO., Chicago
GRAYBAR ELECTRIC CO., INC., New York, N. Y.
STROMBERG-CARLSON TELEPHONE MFG. CO., Rochester

Or any other telephone supply house

Vacuum Grip REG. U.S. PAT. OFF. **Pliers**

Over One Million in Use

Do YOU buy pliers for these 2 REASONS ?

VACUUM GRIP LINEMAN PLIERS
Lineman's Favorite
58-R-8"—$3.25
56-R-6"—$2.00
57-R-7"—$2.50
59-R-9"—$4.00
Name etched FREE on handle of each pair.

THERE are just two reasons for giving preference to one make of tool over another make—greater efficiency and greater economy. Judged on these two points, Vacuum Grip Lineman Pliers stand alone.

Their design, finessed to the Nth degree, adds skill and speed to the lineman's hand. The super-margin of strength built into them from tip to tip, gives them a useful length of life far in excess of ordinary pliers.

A simple running test will prove our claims. Write us today for prices on lots of one-half dozen or more, and details of our Demonstration Trial Offer.

FORGED STEEL PRODUCTS CO., NEWPORT, PA.

Economical
Convenient
Dependable

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TRANSMITTER BATTERY

OUTSTANDING economy in use, dependability, and convenient size make the Ray-O-Vac Transmitter Battery ideal for magneto operated central offices. This battery offers long service capacity, and consequently *low cost per service hour*. Throughout its long life, it provides a notably uniform voltage, due to a special mix formula. Designed particularly for use at operators' positions on telephone switchboards, the Ray-O-Vac Transmitter Battery is so compact, light and small that it may be installed within the switchboard if desired.

RAY-O-VAC COMPANY
(Formerly French Battery Company)
Factory and General Offices: Madison, Wisconsin

Manufacturers also of Ray-O-Vac Rotomatic and Standard Flashlights and Flashlight Batteries

THEY STAND THE "GAFF"

YEARS of satisfactory service under all conditions of anchor guying have proven the dependability of Eversticks. Their great strength and holding power, plus ease and speed of installation are reasons why they are preferred by construction and maintenance engineers the country over.

Everstick Anchors offer a complete line of guy anchors in 2-way, 3-way and 4-way expanding types. All are made of certified malleable iron. Write for bulletin No. 1033 describing this complete line of Everstick Anchors and Pole Line Specialties.

EVERSTICK ANCHOR COMPANY
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WHITALL TATUM INSULATORS

USED for years on telephone, telegraph, railroad and lighting company distribution lines . . . a dependable source of supply for uniform, well-designed transparent glass insulators.

WHITALL TATUM CO.
Glass Manufacturers Since 1836
225 Varick St. New York

The Operators' Corner

By MRS. MAYME WORKMAN
Traffic Supervisor, The Illinois Telephone Association, Springfield, Ill.

SUGGESTIONS to toll center operators for improving the tributary subscribers' long distance service. No. 179

IN ORDER to render satisfactory toll service to tributary subscribers we must have prompt service at the toll center office. There should be no distinction between the service rendered to toll center subscribers and tributary subscribers.

Prompt answering of signals, taking tributary operator's ticket or taking details of call from tributary subscriber without delay, passing call as soon as the necessary details have been received, supervising connection properly, calling time at end of stated period when requested, and at end of initial period on a call originating at a coin-box station, quoting time and charge, or charge at finish of conversation when requested, releasing toll circuit and ringdown trunk promptly at finish of conversation —all these things enter into rendering satisfactory long distance service to tributary subscribers.

The most common service complaint registered by tributary operators regarding service rendered by their toll centers is "delay in taking details of tributary operator's call." Some of the reasons for these complaints as observed by the writer, are: Poor position management, lack of teamwork, answering signals when not in a position to take call, and inattention.

It has been observed that a toll center operator has delayed taking a tributary operator's call for a period of five minutes when an adjacent operator was in a position to take the call. The first operator answered the signal and when the tributary operator said "Ticket" the toll center operator said "Wait a minute" and continued working on a call on which she was having some difficulty. If there is one phrase that is obnoxious to the tributary operator it is "Wait a minute."

There are times in every office when we have what we term "peak loads" or "spurts in traffic," but if these are "nipped in the bud" no serious delay will occur. If the chief operator or supervisor fails to observe a condition of this kind it is the operator's responsibility to call it to her attention. By transferring a local operator to toll or vice versa for a short period this condition can usually be cleared up without delay. If it is not "nipped in the bud" as we have said, calls will be delayed, signals will not be answered promptly and service complaints will follow.

If an operator answers a signal and she finds she is not in a position to take the call, she should find out if an operator at an adjacent position can do so. Do not wait until the call has been delayed three, four or five minutes. Do so immediately. Do not be hesitant about calling upon another operator for assistance when necessary. This constitutes good teamwork.

It is not a common occurrence but it has been observed that a toll center operator said "Wait a minute" to a tributary operator, then closed her key and proceeded to finish a personal conversation with an operator at an adjacent position before taking the tributary operator's ticket. This should *never* happen.

It is every telephone operator's responsibility to render courteous, accurate and efficient service to all telephone users at all times and under all conditions.

We have another responsibility—to work in harmony with our coworkers, not only in our respective offices, but also in dealing with our tributaries and operators at distant offices. If we follow this practice our work will be a pleasure and our service satisfactory.

Questions from Illinois Operators

1. Is it permissible to ask for a line which has been busy for more than five minutes to oblige a subscriber who has asked for this number two or three times?
2. How long can a distant office hold the trunk on a busy line?
3. Are all station-to-station calls person-to-person that are passed collect?
4. What report is entered on a ticket if the party called is in but is unable to talk for a few minutes?
5. When should we start timing a station-to-station call?

For answers to these traffic questions please turn to page 30.

Foreign Telephone News in Brief

During the latter part of 1934 the Persian administration of posts, telegraphs and telephones purchased some 4,000 telephone sets for immediate delivery.

* * *

Greece had 15,913 automatic telephones in service on September 1, 1934, including 2,044 extension telephones. Two years previously the government had but 9,270 telephones in operation, including manual as well as automatic instruments. The Hellenic Telephone Co. is rapidly replacing manual telephones with automatic equipment in all but the smallest towns, according to Commercial Attache K. L. Rankin, of Athens.

* * *

In Japan a merchant with a shop containing nothing but a telephone installation can stock it by pledging the telephone as collateral. The high cost of telephone service, particularly the installation cost which in most localities amounts to several hundred yen (a yen is practically equivalent to $5 in U. S. currency) is loudly lamented by the press of that country.

* * *

Belgium had 312,771 telephones in service on March 1, 1934, an increase of 14,820 stations over the preceding year. About 65 per cent of the telephones in service are automatic, according to Acting Commercial Attache G. R. Canty, of Brussels.

* * *

The National Telephone Co. of Spain (Compania Telefonica Nacional de Espana) had 281,229 telephones in service at the close of 1933 as compared with 85,000 in 1924 when the telephone concession was granted to the company. During 1933 there were installed 33 new exchanges in 20 communities.

The company's fixed assets are valued at $90,212,018. After paying dividends in the amount of $3,861,000, the company had an unappropriated surplus of $645,-354.

* * *

On June 30, 1934, there were 501,402 telephones in operation in Australia, an increase of 13,740 stations over the preceding year.

* * *

Long distance rates between Durban and Capetown, South Africa, from 8 a.m. to 6 p.m. were reduced from $3.89 for a three-minute call to $3.10. Generally speaking, the policy of the department of posts and telegraphs has been to reduce the rates on calls over a distance greater than 270 miles.

BE PREPARED *for* TIMES *of* STORM

That's when speed and security count most — when the energy of your linemen must be conserved—STOCK NATIONAL DOUBLE TUBE and NICOPRESS SPLICING SLEEVES.

There's still three tough winter and early spring months ahead — February, March and April usually mean plenty of snow and sleet storms with their troubles to your linemen . . . National Sleeves are great "trouble shooters." Many companies keep a special stock of National Sleeves, set aside for emergency use only. Experience has proven this is wise forethought.

NATIONAL DOUBLE TUBE SLEEVES are designed and manufactured to make the splicing jobs easier and more efficient. Made exactly to size from the best grade copper, easy to install, with great tensile strength and high conductivity, they save time and energy. Sizes range from 22 B & S up.

NATIONAL NICOPRESS SLEEVES assure you of line joints that are positively air and moisture proof. Thousands of tests have proven that neither moisture, nor air can seep into any line joint made with Nicopress Sleeves. Because of the coating of Nichrome (a hard metal alloy), on the inside of Nicopress Sleeves, which bites into the softer copper of sleeve and conductor under pressure of tool, the joints will not break and the wires will not pull out.

"Nicopress" joints are easily and quickly made either in the air or on the ground and have an exceptionally high conductivity.

Complete details and prices on National Sleeves yours for the asking.

THE NATIONAL TELEPHONE SUPPLY COMPANY

5100 SUPERIOR AVENUE, CLEVELAND OHIO

If it's a SPLICE - Make it a NATIONAL

Here, There and Everywhere

Program Arranged for Nebraska Convention

Secretary G. M. Kloidy of the Nebraska Telephone Association has announced the completion of the program for the thirtieth annual convention of the Nebraska association to be held at Lincoln February 13 and 14.

Speakers for the first day will be John H. Agee, general manager of the Lincoln Telephone & Telegraph Company; G. E. Becker, president of the association; Charles C. Deering of Des Moines, secretary-treasurer of the United States Independent Telephone Association; N. W. Gaines, community specialist, Nebraska college of agriculture; Will M. Maupin, member, state railway commission, and F. C. Builta, assistant to the president of the Northwestern Bell Telephone Co.

On the second day the speakers will be: Thomas Phalen, secretary-treasurer of the South Dakota Telephone Association of Aberdeen; James E. Lawrence, editor, Lincoln Star; W. W. Johnson, district manager of Nebraska Continental Telephone Co., Kearney; Dr. Harold W. Stokes, associate professor of political science, University of Nebraska. H. F. McCulla, general commercial superintendent, Lincoln Telephone & Telegraph Co., will lead the round table discussion at the afternoon session, which will close the meeting.

Secretary Kloidy is telling members that changing business conditions are demanding a few alterations in policy and operation, and that attendance at the convention will give them an opportunity to take home many new ideas and put them in practice for the pull of future business.

• • •

List of Words to Aid In Spelling by Telephone

To avoid mistakes and speed up the service, operators of the Bell companies use a standard list of words to designate the various letters of the alphabet in spelling names and addresses to other operators.

If subscribers are caught saying "N" as in "pneumonia," or "U" as in "Europe," the following appropriate words used by the operators might help:

A as in Alice	N as in Nellie
B as in Bertha	O as in Oliver
C as in Charles	P as in Peter
D as in David	Q as in Quaker
E as in Edward	R as in Robert
F as in Frank	S as in Samuel
G as in George	T as in Thomas
H as in Henry	U as in Utah
I as in Ida	V as in Victor
J as in James	W as in William
K as in Kate	X as in X-ray
L as in Louis	Y as in Young
M as in Mary	Z as in Zebra

• • •

"Tillie Fone" Says Sell Employes First

Our manager was telling me of a new sales angle that he used with business concerns. It was interesting to me, and I believe it will be interesting to you. He makes all the surveys of business concerns and recommends adequate telephone equipment. When he first started selling telephones, it was his custom to make the recommendations direct to the manager of the business.

Where more than two or three people are employed, he has since found it helpful to ask the employes about the telephone service, because they will give him some pointers as to what is needed, telling him the number of calls that are received and placed each day, and this information can be checked with his surveys.

A long time ago he found that when the manager of a concern "blew up" about inadequate telephone service, he blamed his employes. He knew of a sales manager who was told that a big order had been lost because the buyer claimed that every time he telephoned, the line was busy. Needless to say, it was unpleasant around that office for a few days.

The telephone company wasn't blamed; the employes were blamed because the boss expected them to know what telephone service was needed and to arrange for it.

Consequently, in contacting the employes of the concern that is being surveyed, it is a good idea to sell them on proper telephone equipment so that they will begin talking about it. If the manager should ask them any questions about what is needed, they will be prepared to answer them.

Then when the telephone company employe suggests the proper telephone equipment, the manager of the concern will find a number of reasons why he should not object to the proper telephone equipment when his own employes have said what is needed.

• • •

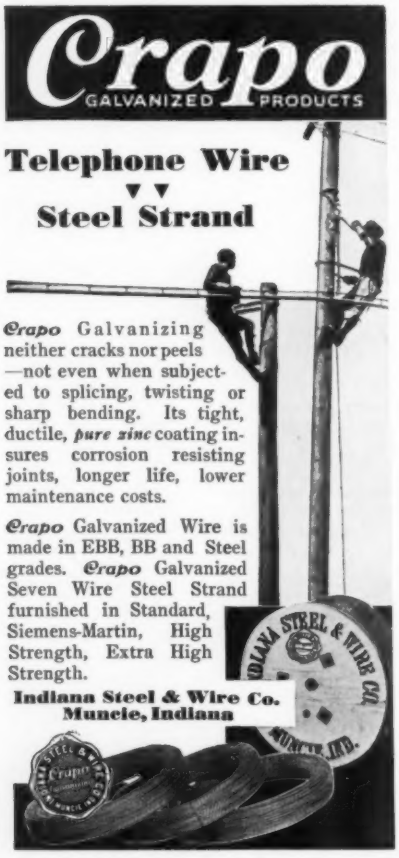
Ohio Companies Regain Subscriber Stations

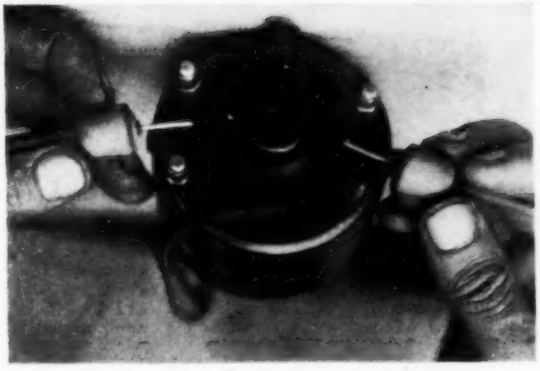
Despite the fact that most telephone companies in Ohio sustained severe losses in the number of subscribers during the depression, many of the losses are being wiped off the slate. Substantial gains have been made by the Ohio Bell Telephone Co. in Columbus, and in other cities and towns throughout the state and the same is true with a number of the Independent companies. This is true of the 11 companies known as the Gary properties.

Since Gustav Hirsch, of Columbus, became general manager of these properties last July, sales campaigns have been under way in the various exchange areas with the result that 900 telephones have been added whereas the companies, prior to that time, had shown a substantial loss in subscribers. These sales campaigns are being continued with every indication that many additional subscribers will be added.

The Northern Ohio Telephone Co., which recently inaugurated sales campaigns in all of its 40 exchange areas, is making very satisfactory headway in the number of new connections that are being made and, according to William C. Henry, general manager, the company is gratified with the showing that is being made thus far.

Another organization which is getting results is the Ohio Standard Telephone Co. which operates a large group of exchanges. This company was able to close 1934 with a gain in number of subscribers, and is continuing its campaigns.


Crapo
GALVANIZED PRODUCTS
Telephone Wire
Steel Strand
Crapo Galvanizing neither cracks nor peels —not even when subjected to splicing, twisting or sharp bending. Its tight, ductile, pure zinc coating insures corrosion resisting joints, longer life, lower maintenance costs.
Crapo Galvanized Wire is made in EBB, BB and Steel grades. Crapo Galvanized Seven Wire Steel Strand furnished in Standard, Siemens-Martin, High Strength, Extra High Strength.
Indiana Steel & Wire Co.
Muncie, Indiana
INDIANA STEEL & WIRE CO.
MUNCIE, IND.



A Pair of Test or "Touch" Wires Can Be Made More Easy to Work With by Forcing Two Small Rubber Fuller Balls or Seats Over Ends of Wires.

Plant Men Get Together

Useful Ideas: Handling Of Test Wires

A very handy and necessary thing about the repair bench is, of course, the set or pair of test or "touch" wires which usually drop from some spot to the back of the working space where they can be easily drawn to the parts on the bench under test or examination for short-circuits.

The ends of the wires are not always easy to grip and hold steadily on many small parts, and an accidental slip of the fingers frequently allows them to contact a not necessarily dangerous but aggravating "hot spot."

Over the ends of such "touch" wires, force two ordinary small rubber Fuller balls or seats, as shown in the accompanying illustration. The hole through the center of them will take the insulation of any wire ordinarily used about the bench. They will stay firmly in place and make such wires very easy to work with and prevent those unexpected awkward slips which nip the fingers. They also prevent the accidental contact of the wire ends while lying unused on the bench.

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A Job Is Not Perfect Unless Done Safely

By JAKE, THE LINEMAN

Mornin' buddies. Brrr, jist feel that old winter wind a' whippin' aroun' the corners. Man, it's days like these that make the cable splicers "cuss" and the "forty-footers" weave around worse than a Hawaiian dancer.

It's nights like the ones we're havin' now that make the radio and the old lounging chair by the fireplace seem mighty "all-fired" nice. Last night I was a' sittin' by the radio twistin' the dials aroun', pickin' up stations here and there, an' gettin' good programs by the score, jist as easy as puffin' on my ole corncob pipe.

As I sat there, twirling the dials an' bringin' in station after station, the perfection of radio was driven home to me At my finger tips were the programs of the world. Each one came on at its scheduled time. Each one was clear and distinct. Absolutely nothing marred the reception except an occasional bit of local static or a "yeowl" from a dad-burned regenerative set.

Everything was perfect. In my mind I visioned the scores of men whose job it was to see that every program was broadcast perfectly. At their dials and control boards they were doing their jobs in "tip-top" fashion. There was no time for costly errors—they had to be on the alert. Their jobs depended upon the care with which they carried out every minute detail of each broadcast.

As I thought of these men in the broadcasting game, and the absolute perfection with which they performed their jobs, the thought sprang into my old thinker that if every worker was forced ter work as perfectly, there would be no more accidents. Old Man Accident would soon discover that his victims were as scarce as kings are in Russia.

Absolute perfection of any kind of work, whether it be making mustache cups or grand pianos, requires that the workers perform the work safely. Any job, marred by a costly or even trivial accident, is a glaring example of someone's failure!

These failures must be stopped if Old Man Accident's game is to be ended. He has bin havin' so much fun at our expense that he thinks he can't be licked —but he can be licked! You telephone buddies of mine can help to turn the tide, jist as soon as every one of you decides that perfect work goes hand-in-hand with perfect safety records.

Wa'll now, what say we take up a few new signals?

Storeroom employes when handling batteries or battery acid material should use great care to see that the acid does not come in contact with the body.

Always block reels of cable which are left on the street, so that they cannot be rolled or tipped over. Put them on as level a place as possible. Put out plenty of warning signs and be sure to put out the red lanterns at night.

Failure to observe this little rule has caused plenty of trouble: When operating machine tools, never attempt to hold the material by hand. Secure it by means of clamps, vises or braces.

Every time you have occasion to prepare a kerosene furnace or blow torch for shipment, make sure that the equipment is emptied of all inflammable liquid.

Tile conduit often becomes cracked or chipped in shipment. When unpacking such material always wear gloves to avoid injury from the sharp edges.

You can always remember this little fact: After every accident someone can always say, "If I had only ....."

Wa'll buddies, I guess that's about all fer today. Until next week remember: "To save yourself many dollars a nd cents, use your common sense and practice safety."

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Some Telephone Things I Didn't Know Until Now

By OSCAR WILL TELL

That telephone purchasing agents are annoyed constantly by the inventors of gadgets.

That a new telephone stand has been invented which leaves both hands of the user free. It's a long period between invention and the market.

That figures compiled by the National Safety Council indicate that a lineman working at the top of a pole is just as good a risk as a man watching him from the sidewalk.

Activities of Commissions and Courts

Hearings on Proposed FCC Appointments

The Senate interstate commerce committee last week held hearings on nominations to the Federal Communications Commission submitted by President Roosevelt. The seven members of the commission have been serving on recess appointments since last July.

Hampson Gary resigned on January 3 and A. S. Prall, of New York, was nominated to fill the vacancy. The Senate committee has voted a favorable report on his nomination (TELEPHONY of January 19).

On January 23 Senator Theodore G. Bilbo, of Mississippi, who calls himself "The Man," opened a long-promised fight to block confirmation of former Judge Eugene O. Sykes as chairman of the commission. Among other things, Judge Sykes was accused by Senator Bilbo of prostituting his official position to force radio broadcasting companies to give free services to Senator Bilbo's opponent in the Mississippi primaries.

Judge Sykes declared Senator Bilbo's charges were "utterly false," and said he had no objection whatever to a full investigation. He asserted that he had made "no unkind remarks" about Mr. Bilbo and had nothing to do with obtaining a radio-hookup, as Senator Bilbo charged.

Senator Wheeler, committee chairman, said he would ask the committee whether it favored an inquiry into the charges. He added that the question of "monopoly" in radio channels must be investigated before the seven nominees for the commission were confirmed.

After the committee recessed the members, including Chairman Wheeler, indicated that Senator Bilbo's charges, because of their gravity, would be thoroughly investigated before taking any action to report out the nomination.

Chairman Wheeler on January 24 said that he was going to introduce legislation to require that the five so-called radio broadcasting zones be represented on the Federal Communications Commission. He said that three of the nominees were from the third zone, three from the second zone and that there was no representation from the west.

The discussion of the zone representation was taken up by the committee with Chairman Eugene O. Sykes, who resumed his testimony which was begun on the preceding day.

Judge Sykes was succeeded on the stand by Thad Brown of Ohio, whom Senator Couzens of Michigan bitterly opposed two years ago because he was a Republican sponsored by Governor Cox of Ohio.

Mr. Brown denied being the author of the proposal to merge the telegraph companies and said he couldn't discuss it. "If that's the case, you're incompetent, and I won't vote for your confirmation," Senator Couzens said.

Answers to Traffic Questions on Page 26

1. It is the standard practice not to ask for a busy line except in cases of emergency. Unless your management has issued instructions contrary to this practice, the standard practice should be followed.
2. Five minutes on a built-up circuit.
3. No. Calls on which the day station-to-station rate is less than 20 cents are subject to the person-to-person rate if the calling party asks you to reverse the charge on the call. If the calling party asks you to reverse the charge on a call on which the day station-to-station rate is 20 cents, the call will take the special collect station-to-station rate of 25 cents.
4. "Wt few" is entered in the space for reports, followed by the time the report was received.
5. If the calling party is holding the line, start timing the call at the first word spoken by the called station. If the calling party is not holding the line, start timing the call as soon as either station speaks to and receives a response from anyone at the other station.

Norman S. Case, vice-chairman of the telephone division of the FCC, followed Mr. Brown and was examined by Chairman Wheeler regarding his law practice before he became governor of Rhode Island. He said he signed the report recommending the telegraph merger. He favored unification of the wire services from point to point as a good thing, but was not so sure about radio being combined with the telegraph wires at this time.

Mr. Case said he thought the Postal and Western Union merger would come first under the commission's plans. He thought there would be sufficient competition in the event of a merger between radio and telegraph on the one hand and voice communication and air mail on the other, he said.

Questioned by Senator Wheeler, Dr. Irving Stewart, chairman of the telegraph division of the FCC, declared that in a merger of Western Union and Postal Telegraph there undoubtedly might be some scaling down of capitalization.

Dr. Stewart cited the provision in the proposed amendment to the communications act covering capitalization of a merged company, pointing out that nothing should be allowed in that capitalization for facilities unnecessary to handle present business of the country and prospective business. Undoubtedly, Dr. Stewart said, facilities at the present time were too large.

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Michigan Bell Rate Cut Hearing Restrained

On January 21 Judge Leland W. Carr of Lansing, Mich., granted the Michigan Bell Telephone Co. a temporary order restraining the Michigan Public Utilities Commission from opening a rate reduction hearing pending proceedings which were to come up January 26 in Ingham county circuit court on the company's bill of complaint attacking the validity of the commission's procedure.

Judge Carr directed the utilities commission to show cause why it should not be restrained from proceeding with its rate hearing pending determination of the case now in federal court.

The hearing on a petition for lower telephone rates was to have started January 22 before the commission.

The telephone company claims that the commission order is an improper exercise of the jurisdiction of the commission and wholly void.

The contention was put forward that the order is an open defiance of the jurisdiction of the federal court for eastern Michigan and would provide for an unreasonable search and seizure of the property of the plaintiff without due process of law in violation of the state and federal constitutions.

The telephone company previously filed in federal court a bill of complaint against the commission, contending that the rates previously prescribed by the commission were too low. This case is now pending in federal court.

The Ingham court is asked to set aside the recent order pending determination of the case in federal court.

• • •

Florida Rate Cut Hearing Postponed

The renewed fight over lower telephone rates in St. Petersburg, Fla., set for hearing in Tampa Wednesday, January 15, was delayed by the illness of Howard P. Macfarlane, attorney for Peninsular Telephone Co.

C. L. Waller, Tallahassee, special master, had scheduled the hearing to take testimony on the company's application for a permanent injunction to restrain an order of the Florida Railroad Commission.

Long distance tolls and special equipment charges, also reduced by the commission, enter into the hearing which originated in a temporary injunction recently granted by Judge E. C. Love in circuit court at Quincy.

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Hugh Drake, Chairman Of Nebraska Commission

The Nebraska State Railway Commission organized for the year by electing Hugh Drake as chairman. J. F. Miller, secretary, will remain for at least six months. The election of Mr. Drake, who is the only republican on the commission of three, was a surprise to other state officials who supposed that with the democrats in control, Commissioner Bollen, the ranking democrat, would be made chairman.

The new commissioner, W. M. Maupin, however, announced that he believed in the application of the seniority rule regardless of politics, and cast his ballot for Mr. Drake.

• • •

Nebraska Commission Appoints Employes

Louis R. Ruud, who has been state accountant for Nebraska for the last two years, has been appointed by the Nebraska State Railway Commission as its expert utility accountant and counsel, at a salary of $275 a month, an increase in stipend of $55 a month. He is a resident of Omaha, and is reputed to be skilled in utility accountancy.

Prof. V. L. Hollister of Lincoln, Neb., has been appointed by the Nebraska State Railway Commission as utility rate expert, a new position made necessary by the death of Chief Engineer Burt E. Forbes, who also specialized in rates. Mr. Hollister has been a member of the faculty of the University of Nebraska, but in recent years has been in general private practice, largely with electrical rates.

• • •

Proposed 2-Per Cent Sales Tax on Utility Services

An organization, known as the Nebraska Tax Association, has prepared for introduction in the legislature a bill levying a 2-per cent tax on all retail sales with a few exceptions, and which also proposes to tax sales of water, electric, gas and other public utility service, including telephones. The plan is to push this as a substitute for taxation of farm and city real estate.

• • •

Southern Indiana T. & T. Co.'s Steps to Reorganize

Reorganization of the defunct Southern Indiana Telephone & Telegraph Co., Seymour, Ind., is a step nearer realization following the first stage of a final hearing recently before Federal Judge Robert C. Baltzell in Indianapolis.

Articles of incorporation are to be filed for a company to be known as the Indiana Telephone Co. While further hearings are to be held, provisions granted recently indicate that only bondholders will retain interest in the new company, for stocks, both preferred and common are adjudged valueless. No exceptions or opposition to the case have appeared.

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Qualifications of Nebraska Commissioners

Railway Commissioner F. L. Bollen, Lincoln, Neb., has asked the judiciary committee of the House to introduce a bill along lines that he has drawn for their guidance and which deals with the qualifications of members of the Nebraska State Railway Commission. He would have the law so drawn that no one could serve unless he possesses the same qualifications as set out in the statutes for district judges. This means that he would have to be a graduate of an accredited school of law and have three years' private practice.

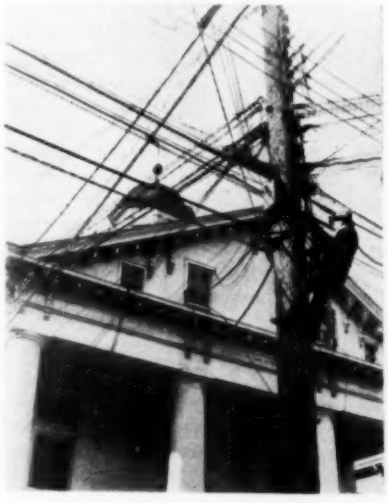
In addressing the committee Mr. Bollen said that, for the future, the commission should be equipped for higher efficiency than was possible in the past. He said that the voters had no means of properly ascertaining for themselves the qualifications of the men who present themselves as candidates for the party nominations.

Mr. Bollen said that at the last primary election there were nearly two dozen candidates on both tickets, and only two of them were qualified for membership on the commission. Neither was nominated on either ticket, he said.

Just as Mr. Bollen had finished this statement Commissioner Maupin, who was the successful candidate at the late

Rising to the Emergency

at Flemington, New Jersey



The ears of the world are listening in for news of the Bruno Richard Hauptman trial cleared through the facilities on this pole.

P.B.X., Telephone, Telegraph, teletypewriter, radio — Every service known to Telephony is furnished.

Not only was this service demanded for the Hunterdon County Court House, but for hotels and private residences, where newspaper men, radio broadcasters, feature writers, lawyers, court attaches and all the rest of the visiting thousands have temporarily taken quarters.

Yes, these are busy, but successful days in the central office of the New Jersey Telephone Company.

The pole cable terminal in this photograph is a Cook X-B Terminal.

Cook Electric Co.
CHICAGO

election but who had not been invited to the meeting, entered the doorway. He answered Mr. Bollen's indirect declaration that he was not qualified for membership by saying that the trouble with the commission is there have been too many lawyers on it in the past, and that what was most to be desired were a few members with just good commonsense viewpoints of the problems attached to membership.

• • •

Commission Report Urges Broader Authority

A report from the Illinois Commerce Commission to Governor Horner recommends legislation (1) to give the commission broader powers over depreciation allowances and reserves of utilities, (2) to permit investigation expenses charges against utilities to be put into a revolving fund for use in further inquiries, and (3) to enlarge the commission's authority to authorize experimental rate and service orders.

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Oklahoma Commission Has New Chairman

On January 14 A. S. J. Shaw took the oath of office as a member of the Oklahoma Corporation Commissioner, to succeed E. R. Hughes, republican. The commission thereupon reorganized by electing Reford Bond, of Chickasha, as chairman, and Joe O'Brien, of Oklahoma City, as secretary to succeed Ed Hicks, secretary for the past eight years.

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Exclusive Telephone Accountants
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Systems Installed
Audits and Special Services
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ACCOUNTING
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Certified Public Accountants
Specializing in Telephone Accounting and Rate Cases Since 1918
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Indianapolis, Indiana

J. G. WRAY & CO.
Telephone Engineers
Specialists in Appraisals, Rate Surveys, Financial Investigations, Organization, and Operation of Telephone Companies.
3324 Bankers Bldg., Chicago

Commissioner Bond was quoted, after the reorganization, as saying that the Tulsa telephone rate case, in which the commission recently refused to order a rate reduction, would be reopened. Commissioner Bond did not sign the order in the case.

• • •

Arguments on Wisconsin Bell Cases on March 25

Federal Judge Patrick T. Stone, of Madison, Wis., on January 24, announced that the arguments in federal court on the two rate reduction cases of the Wisconsin Telephone Co. are now scheduled to be heard March 25.

The hearing was originally set for January 7 but was postponed to January 28. At the joint request of attorneys for the company and for the Wisconsin Public Service Commission, the date was again postponed.

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Ohio Body Notified of Bell Filings with FCC

In a letter received January 7 from A. J. Allen, vice-president of the Ohio Bell Telephone Co., the Ohio Public Utilities Commission is advised that the American Telephone & Telegraph Co. has filed with the Federal Communications Commission, Washington, D. C., combined returns as permitted by the commission for the Bell System companies subject to the communications act of 1934, in response to order No. 12 of October 31, 1934, and order No. 13 of November 7, 1934 of the telegraph division of the FCC.

• • •

Nebraska Commission Seeks Appropriation

The Nebraska State Railway Commission has asked Governor Cochran to recommend to the legislature an appropriation of $111,000 for the next two years, made up of: Statutory salaries of commissioners and secretary (two commissioners at $5,000 a year and one at $3,400), $32,080; salaries and wages of employes, $56,000; extra help, traveling expenses and rate investigations, $15,000, and maintenance, $8,000.

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Commission Rulings and Schedule of Hearings

FEDERAL COMMUNICATIONS COMMISSION, Washington, D. C.

February 4-5: Hearing on the applications of 11 individuals to hold positions as directors or officers of more than one carrier subject to the commission's jurisdiction. Included in the list of those to appear are Sosthenes Behn of International Telephone & Telegraph Co., Walter S. Gifford of American Telephone & Telegraph Co., David Sarnoff of Radio Corporation of America, and others. The hearing was postponed to these dates from January 21.

ILLINOIS.

January 30: Hearing on application of the Illinois Bell Telephone Co. for consent to and approval of a lease to the Atlantic Trading Corp., not a public utility, of certain described real estate situated at 305A West Washington St. in the city of Chicago.

January 30: Hearing in Chicago on complaint of Herbert S. Mayers and Josephine M. Mayers against the Illinois Bell Telephone Co. as to classification of telephone service by respondent and request for retroactive reclassification in the city of Chicago.

MISSISSIPPI.

February 5: Continued hearing, adjourned to this date from January 18, in the commission's investigation of the rates of the Southern Bell Telephone & Telegraph Co.

MISSOURI.

January 21: Joint application filed by Troy Simpkins for authority to sell and Ida B. Stouffer to purchase the Purdy Telephone Co. located at Purdy.

NEW YORK.

January 24-25: Hearing in New York before Commissioner Brewster in the commissioner's investigation of the rates of the New York Telephone Co.

January 25: Hearing in Buffalo before Commissioner Burritt on complaint of A. E. Newton vs. the Jamestown Telephone Corp. as to its rates and charges for facilities and service used in connection with transmission of radio programs.

January 31: Hearing in New York before Assistant Counsel H. M. Chamberlain in the commission's investigation as to the telephone service furnished by the New York Telephone Co. to H. Richard Panzer at Hastings-on-Hudson.

OHIO.

January 24: Application filed by Mrs. Goldie M. Marlatt, R. F. D., Hillsboro, for authority to sell the property of the Concord Bell Telephone Co. to Harvey Daniels. The company serves a number of subscribers at Sugar Tree Ridge. Mr. Daniels also applied for authority to make a 6 per cent note to Mrs. Marlatt in payment for the plant.

February 14: Hearing on petition of the Johnston Citizens Telephone Co. for authority to sell its outside plant to the North Eastern Ohio Telephone Co. and to abandon its central office at Johnston in Trumbull county. The company, in its petition, pleaded that its operations are no longer self-sustaining.

OKLAHOMA.

January 25: Hearing on application of the Bessie Telephone Co. for transfer of the telephone exchange at Bessie from the Standard Telephone & Telegraph Co.

January 25: Hearing on application of W. C. Robertson for transfer of the telephone exchanges at Strong City and Hammon from the Standard Telephone & Telegraph Co.

January 30: Hearing on application of the Southwestern Bell Telephone Co. to discontinue exchange service at Kildare.

January 31: Hearing on application of R. C. Simpkins to serve Jesse and vicinity with local and long distance telephone service.

February 6: Hearing on complaint of the city of Garber vs. the Western Telephone Corp. for investigation of rates and service.

Buyer's Weekly Guide

A list of firms and companies offering equipment, supplies or services for operating telephone companies

ADDING MACHINES

Burroughs Adding Machine Company, Second Blvd., Detroit, Mich. — Adding, Bookkeeping, Calculating, Billing and Accounting Machines, Electric Carriage Typewriters, Standard Typewriters, Operator Correct-Posture Chairs. Burroughs machines are in use today in hundreds of progressive telephone companies throughout the country.

BATTERIES—DRY CELLS

Bond Electric Corporation, 257 Cornelison Ave., Jersey City, N. J.—Bond Telephone Dry Cells, Bond Flashlights and Batteries, Industrial Flashlights and Batteries, Bond Dry Batteries, Storage Batteries, Voltpruf Special Flashlights for linemen. Victor Telephone Cells and Bond Formula 1216 Inhibitor, ideal for keeping the cooling system of trucks and service cars free from rust, scale and corrosion.

National Carbon Company, 30 E. 42nd St., New York.—"Columbia" Telephone Dry Batteries; "Eveready" Flashlights, Flashlight Batteries and Long Life Dry Cells, "National Pyramid" brushes, carbon, graphite and metal graphite for motors, generators and rotary converters. "Eveready" Prestone anti-freeze; "Eveready" Rustone rust preventive; and "Eveready" Air Cell telephone operators' transmitter batteries.

Ray-O-Vac Company, Madison, Wis. —Ray-O-Vac telephone batteries — longer life and better service proven by tests in accordance with U. S. Government standards and records of users. Ray-O-Vac flashlights and industrial flashlight batteries are other items showing Ray-O-Vac's outstanding quality.

BATTERIES—STORAGE

The Electric Storage Battery Company, Allegheny Ave. and 19th St., Philadelphia, Pa.—Exide Storage Batteries. Branches: Boston, New York, Rochester, Philadelphia, Pittsburgh, Washington, Atlanta, Cincinnati, Cleveland, Detroit, Chicago, Kansas City, Minneapolis, St. Louis, Denver, San Francisco and Seattle.

BATTERY CHARGING EQUIPMENT

General Electric Company, Bridgeport, Conn.—Tungar battery chargers. G-E pole line hardware. Cable filling compound.

CABLE—LEAD ENCASED

American Electrical Works, Phillipsdale, R. I.—Paper telephone cable, switchboard cable, bare copper cable. Chicago Office: 112 W. Adams St.; Cincinnati: Traction Bldg.; New York: 100 E. 42nd St.

British Insulated Cables, Ltd., Surrey House, Embankment, W. C. 2, Factory: Prescot, Lancashire, England.—Telephone cable of all sizes and capacities.

General Cable Corporation, 420 Lexington Ave., New York, N. Y.—Paper telephone cables of standardized manufacture for over forty years. Weatherproof and insulated copperweld drop wire.

Eugene F. Phillips Electrical Works, Ltd., Montreal, Can.—For any type of wire or cable used in telephone, telegraph or power work get in touch with "Phillips." Manufacturers of bare and insulated copper wires, rubber insulated wires, enameled wire, magnet wire, telephone cables, power cables, switchboard cables, flexible cords, copper rods, etc.

CABLE RINGS

National Telephone Supply Company, 5100 Superior Ave., Cleveland, Ohio.—National Cable Rings, National Splicing Sleeves. Non-Breakable Messenger Cable Hangers, Marlin and Swisher Cable Hangers and Custom Galvanizers. National cable rings are practical because they are two-way,—they allow the cable to be pulled in either direction. National sleeves make secure the weakest points in the line. If it's a splice—make it a National.

CABLE TERMINALS

Cook Electric Company, 2700 Southport Ave., Chicago, Ill.—Protective Pole Cable Terminals, Unprotected Pole Cable Terminals, central office protection, lightning arresters, sleeves, fuses.

Reliable Electric Company, 3145 Carroll Ave., Chicago, Ill.—A complete line of telephone and switchboard protectors and specialties. All sizes of cable grips.

CARBON DIAPHRAGMS

Noris Carbon Company, Inc., 160 5th Ave., New York, N. Y.—Carbon diaphragms, carbon back plates, granular and globular carbons, lightning arresters.

CONDUIT

Brazil Hollow Brick & Tile Company, Brazil, Ind.—Makers of Brazil Vitrified Tile. Conduit.

CORDS, CABLE AND WIRE

Lenz Electric Manufacturing Co., 1751 N. Western Ave., Chicago—Established 1904—telephone and switchboard cords for all makes of equipment, braided and lead-covered telephone cable, flame-proof jumper wire, interior telephone wire, switchboard wire.

CORDS AND WIRE

Runzel Cord & Wire Co., 4727-31 Montrose Ave., Chicago—Telephone and Switchboard Cords, Flame-proof Jumper Wire, Switchboard Wire, Interior Telephone Wire. W. L. Runzel, President, has devoted over 40 years to the making of fine telephone cords.

ELAPSED TIME RECORDERS

Calculagraph Company, 50 Church St., New York, N. Y.—Calculagraph is the world's standard elapsed time recorder and gives you toll records printed with elapsed time to the second. Both spring driven and electric motor models are available.

POLES

B. J. Carney & Co., 100 N. 7th St., Minneapolis, Minn.—Western red cedar poles. Pentrex Butt Treated or Plain.

Alfred E. Cowling, Scotstown, Quebec.—Eastern cedar poles, plain or butt treated.

MacGillis & Gibbs Company, Milwaukee, Wis.—Northern White and Western Red Cedar Poles. Plain or butt-treated. Immediate quotations on request.

Michigan Pole & Tie Company, Newberry and Grand Rapids, Mich. — "Poles with Character." Northern White and Western Red Cedar. Strategically located yards, Minneapolis, Minn., and Reed City (Lower Michigan), insure quick deliveries.

H. Sigalet & Company, Ltd., Lumby, B. C., Canada — Western Red Cedar Poles. Plain or Butt treated.

Valentine Clark Corporation, 2516 Doswell Ave., St. Paul, Minn.—Finished Cedar Poles. Plain or Butt treated.

SUPPLIES, SWITCHBOARDS AND INSTRUMENTS

Automatic Electric Company, 1033 W. Van Buren St., Chicago, Ill.—Public Automatic Dial Systems, Private Automatic Dial Systems, Telephones, relays, signalling and control equipment.

Automatic Electric Company, Ltd., Milton Road, Edge Lane, Liverpool, England. —Automatic Telephone Equipment.

Automatic Electric Sales Company, Ltd., 1027 W. Van Buren St., Chicago, Ill.—Public Automatic Dial Systems, Private Automatic Dial Systems, Manual Telephone Equipment, telephones, storage batteries, wire, cable, poles, etc.

Kellogg Switchboard & Supply Company, Adams & Aberdeen Sts., Chicago, Ill.—Engineers and designers, manufacturers and suppliers of complete equipment for telephone exchanges and communication systems. Manufacturers of "Master-built" Common Battery, Magneto and PBX Switchboards, "Masterphone" Telephone Instruments, and a complete line of telephone supplies, including bronze drop and interior wire.

North Electric Manufacturing Company, Galion, Ohio—Machine switching telephone systems. Automanual and Automatic. "All-Relay" Switching Apparatus (Dialless and Dial Control). Unattended Satellite Systems.

Siemens Brothers & Company, Ltd., Woolwich, England—Automatic and Manual Telephone Equipment.

Stromberg-Carlson Telephone Manufacturing Company, 100 Carlson Road, Rochester, N. Y. — Telephone apparatus of all kinds, switchboard cords, cable and general telephone supplies.

TOOLS

Crescent Tool Co., Jamestown, N. Y.—CRESTOLOY Pliers, Curved Needle Nose Pliers, Heavy Diagonal Cutting Pliers, Linemen's Side Cutting Pliers, End Cutting Nippers, Crescent Hack Saws.

TRANSMITTER REPAIRS

The Telephone Repair Shop, 1760 Lunt Ave., Chicago, Ill.—Transmitters completely rebuilt and arranged for either magneto or C. B. service. Transmitter fronts and backs refinished in black. Transmitter buttons cleaned and refilled. Receivers repaired; ringer coils and generator armatures rewound.

CLASSIFIED SECTION

Rates 10 cents per word payable in advance. Minimum charge $2.00 for 20 words or less.

RECONSTRUCTED EQUIPMENT

Model No. 6 Style C Flush type Spring Driven Calculagraph, Rebuilt and Refinished complete with New Ribbon @	$26.50
Pedestal type Spring driven Calculagraphs, complete as above @	36.50
Western Elec. No. 20 desk set with W. E. Trans. & Rec. complete with No. 240 3-bar 1000-1600 or 2500 ohm external post connection signal set @	8.35
Double pole, double throw 15 Amp. Knife switches @	.15
Kellogg No. 118 desk set with Kellogg Trans & Rec. complete with W. E. No. 240 3-bar 1000-1600 or 2500 ohm external post connection signal set @	8.35
Western Elec. No. 1533A C. B. Steel hotel sets with W. E. Trans & Rec., 1400-ohm ringer and Booster Coil @	7.50
Western Elec. No. 50 latest type 3-bar Generators with crank and screws @	1.90
Western Elec. No. 143 Receiver with repolished shell and New Cord @	1.00

REBUILT ELECTRIC EQUIPMENT CO.
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1940 W. 21st St., Pilsen Station
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TEST SET
Lineman's test set with finder coil for locating distance and direction to trouble. Sent on trial.

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Ottawa, Ill.

RINGING MACHINES

Holtzer Cabot Type

Motor 110-volt, 60-cycle A. C. Generator 80 volts, 19-cycle A. C.

$45.00

Motor 115-volt D. C. Generator 80 volts, 19-cycle A. C.

$40.00

First-Class Condition.

Guaranteed.

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250 to a Barrel
$25.00 per 1000

F.O.B. Lincoln, Neb.

Lincoln Tel. & Tel. Co., Dept. "A"

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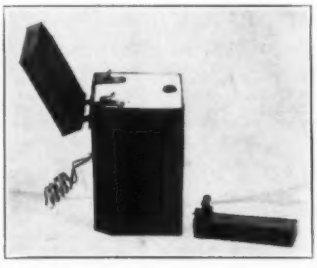
W. M. MILLER & SONS
2553 W. Madison St. Chicago, Ill.

HELP WANTED

WANTED—CHIEF CLERK
High-grade man for commercial dept. of Independent Telephone Co., located in Central States. Must know revenue stub accounting, billing and collection practices, work order and directory routines, etc. Must be dominating, aggressive type with ability to organize and operate efficiently. A permanent, valuable connection for the right person. Address 8411, care of TELEPHONY.

FOR SALE

FOR SALE — Magneto telephone exchange in California. 200 subscribers. Incorporated city on main California highway. Good agricultural district. Correspondence solicited. No trades. Box 8410, care of TELEPHONY.



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Joint Resolution Provides Extensive Investigation

(*Concluded from page* 12.)

(d) The effect of monopolistic control upon the reasonableness of telephone rates and charges, upon the methods of competition with Independent telephone companies, and upon the character of services rendered, and the alleged unfair or discriminatory practices with respect to such campanies and with respect to radio broadcasting or public speaker "hook-ups."

(e) The effect of mergers, consolidations, and acquisitions of control by telephone companies, including the determination of whether there has been any "write-up" in the purchase price of property, equipment or intangibles, the fairness of the terms and conditions of any merger, consolidation, or acquisition, and the public interest therein, and the effect thereof upon rates or service.

(f) The accounting methods of the companies, particularly with reference to depreciation accounting, apportionment of investment, revenues and expenses between state and interstate operations, employe pension funds, and valuation of properties for both rate and tax purposes.

(g) The methods of competition with other companies or industries, including the determination of whether or not there has been any sale or refusal to buy from or sell to competing companies, or suppression of patents, and the expansion of the companies into fields other than telephone communication, including teletype service, telephoto service, telegraph service, broadcasting, motion and sound picture production and distribution, and the manufacture of electrical equipment, so far as such expansion may relate to or affect communications.

(h) Whether or not the companies have sought through propaganda or the expenditure of money or the control of channels of publicity to influence or control public opinion, legislative or administrative action, or elections.

Section 4: The inquiry into certain practices of telephone carriers subject to the Communications Act of 1934, recently instituted by the Federal Communication Commission pursuant to its telephone division order numbered 11 and statement of November 14, 1934, may be consolidated with the investigation required by this joint resolution in the manner and to the extent deemed desirable by the commission.

Section 3 defines the meaning of the term "company." Section 5 authorizes the FCC to hold hearings, to contract for stenographic reporting service, to utilize its regular personnel and to employ such additional experts and assistants as may be found necessary.

This section also authorizes the commission to have access to all books and records of any company or organization under investigation and to require by subpena the attendance and testimony of witnesses and the production of such books and records which it deems relevant and material to the inquiry.